

Flow

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DETROIT

THE MAGAZINE OF MODERN MATERIAL HANDLING AND PACKAGING METHODS



IN THIS ISSUE:

{ Centralized Receiving For Supplies . . . Steel Storage . . .
Overload Cut-Out Devices . . . Fluid Press Room Layout
. . . Pallet Program For Bags, Drums . . . Engineering Data

*You've put
your finger, on it-*

"Dependable"

You can say that again, Mister!

Wherever you see the Hevi-Lift, it's the same reliable workhorse — always ready to take over the heavy loads at the press of a button. You lift and transport anything up to 15 tons . . . and with 5-step variable speed control if you want it.

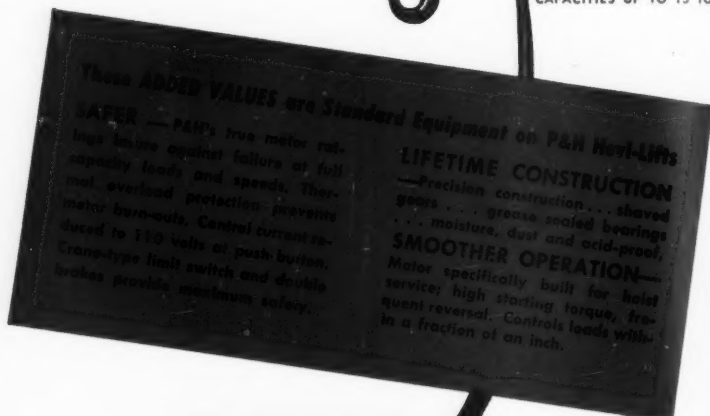
That's why hoist-wise buyers insist upon the Hevi-Lift for the vital jobs in production — to move their loads in less time, with less effort, at less cost.

The important point is this — the Hevi-Lift is *dependable*. Another product of P&H — America's largest builder of overhead materials handling equipment.



Handle it
"thru-the-air"
at lower cost!

CAPACITIES UP TO 15 TONS



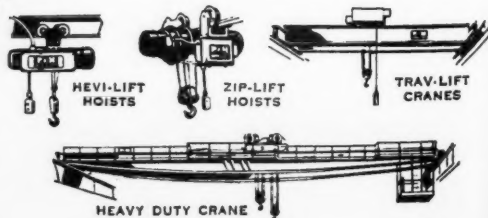
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How to Give Your Boss Relief from "COST-ITIS" Headaches and Get Yourself a Raise!

How about doing your boss a favor, and a good turn for yourself, at the same time? We mean a *money-saving* favor for your boss, and a money-making, salary-raising boost for you.

Your boss needs the answers to a lot of 64 dollar questions right now. Answers, like what to do about profits being squeezed, prices under pressure, sales declining, costs already cut to the bone, but *still too high*.

And the biggest headaches of *all*, are his "COST-ITIS" HEADACHES! Give him relief from that dizzy problem, and he will know how to lick the others.

But often your boss can't see the forest for the trees. So we're tipping you off to a cost-cutting way he *ought* to know about, but often *doesn't*, because somebody in the plant took him too literally, when he said: "No more capital expenditures."

That way, is the material handling Automatic Electric Truck way that can cut your material and product handling costs AS MUCH AS HALF!

If you're using antiquated, manual handling methods of *lifting and moving* your products, it's a cinch that amazing, low original cost Automatic Electric Trucks are just what you and your boys

need to lighten your work and go home at night practically daisy fresh.

And for the boss, it's the "COST-ITIS" headache relief he will happily pay off on, and the payee might as well be *you*!

So mail the coupon, and get all the money-saving facts about these famous industry-tested electric trucks. Find out how, with effortless, easy finger-tip-control, they lift, move and stack hundreds of pounds or tons and tons so easily, a stenographer could operate them in a breeze.

Yes, these mighty giants of electric power *do all the work*. One man accomplishes as much as three men doing fatiguing *manual* handling. The other two can be moved to more productive, *better paying* jobs.

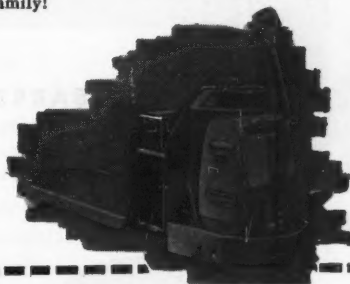
That's *cost cutting* that pays off for everybody!

So, before the boss says: "There must be something wrong here, boys," give him the Automatic Electric Truck money-saving story. When you show him literally thousands of dollars he can save *without* cutting wages, and *without* layoffs, he will take back that order: "Lay low on capital expenditures."

Because, as *you* and *he* can see, cutting material handling costs with Automatic Electric Trucks is not a capital expenditure, but a money-maker for *everybody*... management, white collar workers, and labor.

So again we say: mail the coupon, read up on the fascinating facts we give you, and then trot upstairs and really show the boss *something*! He will listen, he will be amazed, he will buy.

And start planning now, *all the extras* that RAISE will bring you and your family!



Trade Automatic Mark

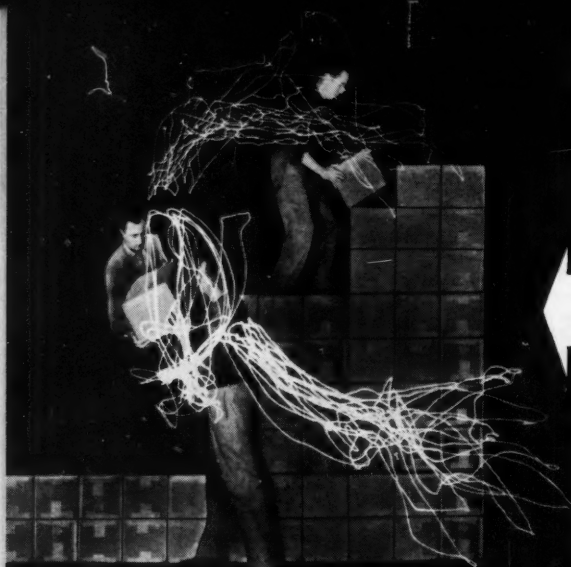
141 W. 87th St., Dept. X-9, Chicago 20, Ill.
Please send me complete money-saving facts on amazing Automatic Electric Trucks without obligation.

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By.....Position.....

Street Address.....

City.....Zone.....State.....



Here, the camera plays detective and reveals the wasted time and effort involved in stacking boxes by hand. Light bulbs placed on worker's wrist record this waste motion.

WHY PILE UP— COSTS



this way?

cut costs with **BARRETT** **PORTABLE ELEVATORS**

Up . . . up . . . up go your costs . . . when you're willing to fritter away time and effort in hundreds of wasteful hand operations every day. But down come costs when you install Barrett Portable Elevators. One man does the work . . . does it quicker and more efficiently than 3 with old hand methods. That's the way to eliminate waste and save money in your plant!

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And you save plenty of it with Barrett Portable Elevators. Take these materials . . . often requiring floor level storage because they're too heavy for hand stacking . . . and pile them ceiling high. All that wasted air space is put to work . . . and floor space is cleared for extra production. And Barretts save, too, on heat, light and maintenance . . . perhaps even the cost of a new building.

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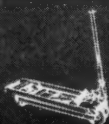
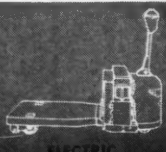
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Handling
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Flow

VOL. 5, NO. 3 • DECEMBER, 1949

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LESTER P. AURBACH, V. Pres.

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"Acceptance under section 34.64, P. L. and R. authorized at Milwaukee, Wisconsin."

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COVER PHOTO—This is one of 60 miscellaneous presses which are grouped by bridge crane for progressive parts flow without inter-operational handling at new Carrier Corp. plant at Syracuse. Bale attachments were designed for taking the press to the work when it is uneconomical to take the work to the press.

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FLOW is indexed regularly by Engineering Index, Inc.

SUBSCRIPTION RATES

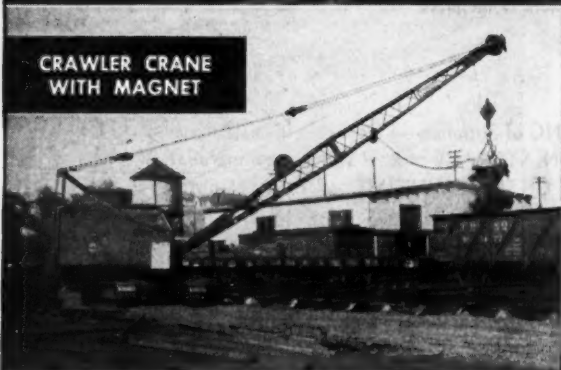
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**LINK-BELT
SPEEDER**

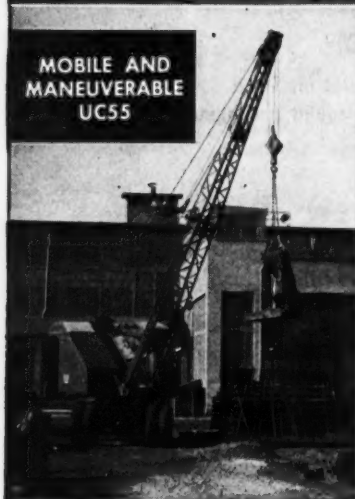
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**CRAWLER CRANE
WITH MAGNET**

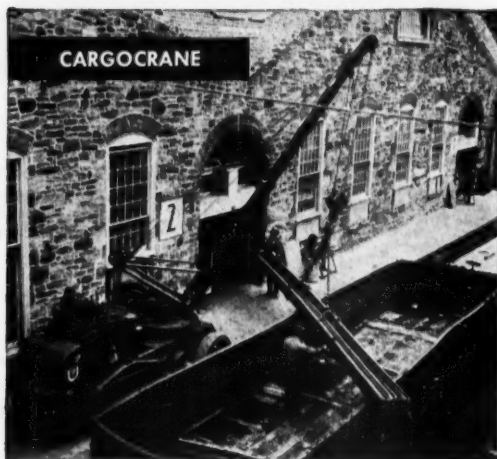


**MOBILE AND
MANEUVERABLE
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Shovel-Cranes

CARGOCRANE



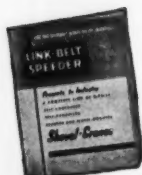
**IN THE BROAD LINK-BELT SPEEDER
LINE THERE IS A TYPE AND SIZE
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Loose or bulk material, steel and lumber, or product parts in assembly—you can handle any or all of them efficiently and economically with Link-Belt Speeders.

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Lifting attachments are quickly interchangeable to provide hook-block, grapple, or clamshell bucket, to suit any type of material. See the nearby Link-Belt Speeder distributor for assistance in selecting a machine to fit your conditions.

11,012

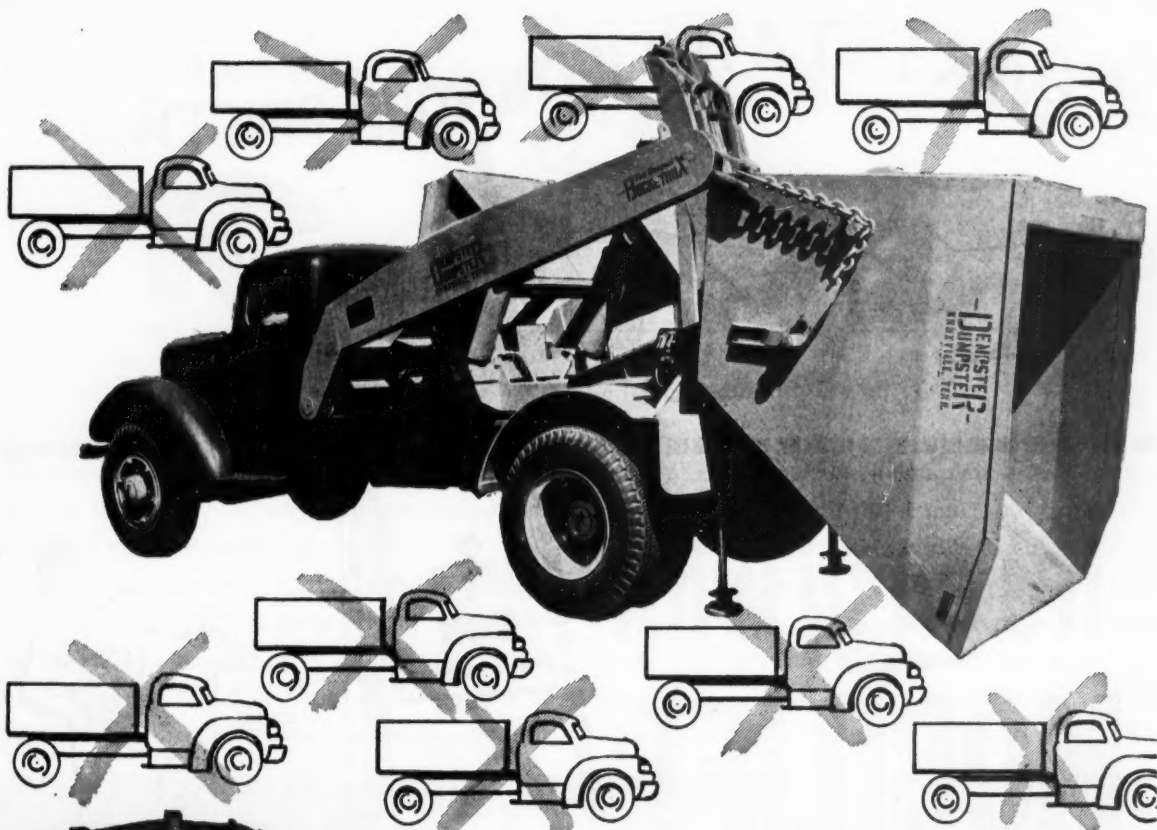


This book is full of illustrations and valuable suggestions on materials handling with Link-Belt Speeders. Send for a copy — NOW. Book No. 2503.

LINK-BELT SPEEDER

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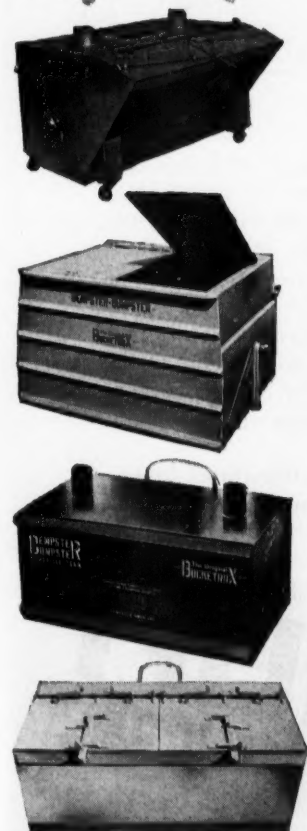
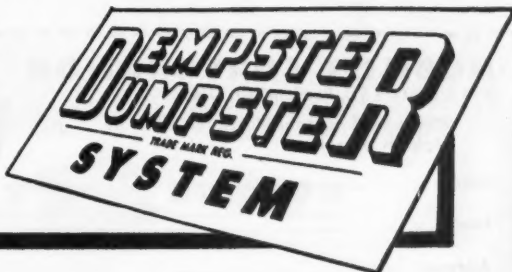
A simple reply to one of our advertisements . . . a meeting of probing minds over the problems involved . . . the replacing of ten conventional trucks with only one Dempster-Dumpster truck unit and 99 containers . . . fifty thousand dollars annual savings for this one firm.

That, briefly, was the result of a simple inquiry for information about the Dempster-Dumpster System of materials handling.

A comprehensive Dempster-Dumpster survey revealed costly delays, unnecessary handling of materials, and much time wasted by loading crews. All were eliminated to the tune of \$50,000 savings annually. Fast pick-up, hauling and dumping of pre-loaded Dempster-Dumpster containers replaced the old method of plant hauling. Ninety-nine detachable containers, built in over 20 sizes and designs for the specific materials they handle, were spotted at material accumulation points. Some are handled by fork trucks, others by overhead cranes within plant buildings. As containers are filled, the Dempster-Dumpster truck hoisting unit and one man, the driver, picks up each container, hauls it to its destination, dumps it and returns the empty container for refilling.

Pick-up and dumping of these detachable containers takes less than 60 seconds. The entire operation works to an on-the-run schedule. One truck hoisting unit handling 99 containers and doing the work formerly requiring ten conventional trucks. Let us bring you the complete details of the Dempster-Dumpster System.

Containers, in standard and special types, in capacities from 1½ to 10 cu. yds. are available. Whatever your materials are, be they heavy, light, bulky, dust, liquid, waste, raw or finished, you'll find a Dempster-Dumpster container ready, or custom built, to do the job more efficiently.

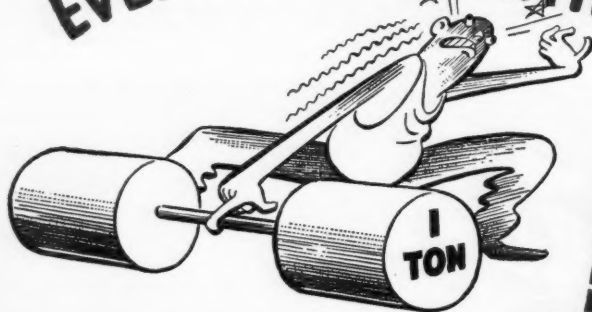


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Knoxville 17, Tennessee

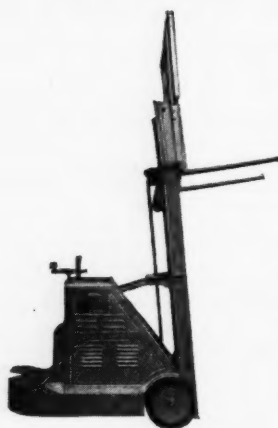
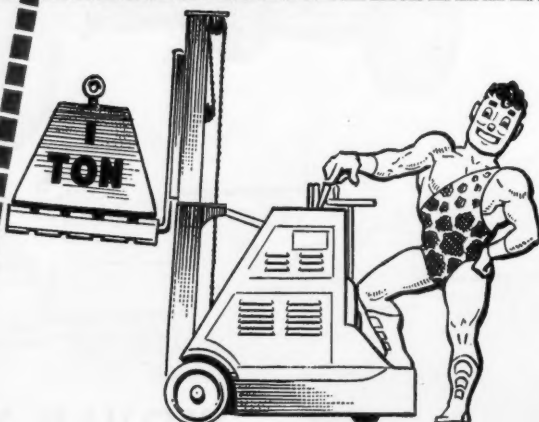
FLOW • DECEMBER, 1949

EVER LIFT A TON WITH YOUR FINGER



?

it's *easy* with
MOBILIFT



Three little easy-to-operate levers at fingertip level do all the work on a Mobilift. One hoists loads of a ton or more up to ceiling height. Another controls the tilt of the load. A third lever regulates the machine's travel speed. To make Mobilift even easier to operate it has no gears to shift—going forward or backward at the touch of a lever.

Such ease of operation has built Mobilift a reputation as the most maneuverable of all lift trucks—more trips per hour, more tons of materials per day. Let us show you why Mobilift's easy handling makes such a hit with both warehouse operators and business executives.

Mail the coupon below and we'll send you illustrated literature that explains more about Mobilift's cost-cutting advantages.

MOBILIFT CORPORATION

835 S.E. Main St., Portland 14, Oregon

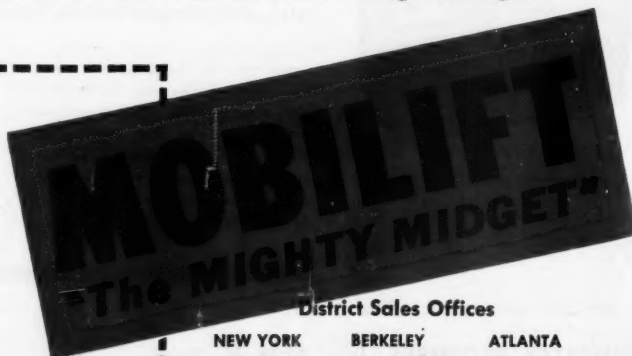
Please send me your illustrated folder on Mobilift operation. F-5

Name _____

Firm _____

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City _____ State _____



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Achieves Lower Costs by Mechanizing Materials Handling

The economical mass movement of bulk materials in *any* location . . . in *any* industry, requires a carefully planned handling system.

Your problem may not involve the handling of 1,000 tons of rock per hour or the design and equipping of a new plant at track level, but the basic need for low-cost handling is common to all industries. Stephens-Adamson engineers apply

years of experience and a complete line of equipment to solve handling problems . . . large or small.

So . . . if you handle materials in bulk . . . S-A engineers will be glad to survey your operations and make recommendations toward better and lower-cost handling. We are ready to discuss the possibilities if you will write us to say you'll listen. There is, of course, no obligation.



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DESIGNERS AND MANUFACTURERS OF ALL TYPES OF BULK MATERIALS HANDLING EQUIPMENT

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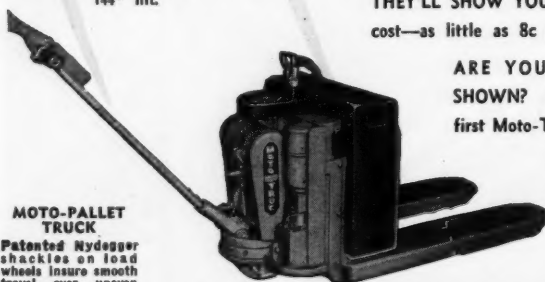
**MOTO-
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A Shorter Truck
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**MOTO-TELESCOPIC
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Capacity: 4,000 lbs., 60"
lift; 2,000 lbs., up to
144" lift.



**MOTO-PALLET
TRUCK**
Patented Nydegger
chuckles on load
wheels insure smooth
travel over uneven
floors, elevator en-
trances, etc.

**MOTO-TRUCS ARE THEIR OWN
BEST SALESMEN**

THEY'LL SHOW YOU the advantage of their shorter overall length (up to 15") by operating in narrower spaces, and how you can gain more storage space.

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**ARE YOU WILLING TO BE
SHOWN?** Why not order your
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We are confident you
will soon want more.
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The MOTO-TRUC Co.
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CLEVELAND 3, OHIO.

**ORIGINATORS OF
MOTORIZED HAND TRUCKS**



To FLOW:

Strapped Pallet Loads

In order to simplify our material handling operations, the Swedish railways wish to stimulate shippers to send goods as unit loads on pallets. As a part of this labour we intend to publish a booklet, containing information and recommendations as to palletization. In this we also intend to show various methods to fix loads on pallets. Doubtless the steel strapping method in many cases is the best method. We want to ask you if you could send us some booklets, photos, etc., showing typical examples how to fix various loads on pallets by steel strapping. The more examples we can get, the better it is. We thank you in advance.—Bengt Adamson, Secretary of the Committee, Royal Administration of the Swedish State Railways, Committee for Standardization of Pallets, Stockholm, Sweden.

To FLOW:

Instruction In Handling

I would like the name of one or several schools that are providing correspondence instruction in material handling. I have had 2½ years of mechanical engineering and at the present time I am engaged in sales work for a large company. However I would like to have more education on the entire subject.—James R. Douglass. Duluth, Minn.

Quite recently the Lincoln Extension Institute, Inc., Cleveland, added a course in material handling to its curriculum for factory executives.—Ed.

To FLOW:

Bagged Materials

Would you kindly send me copies or articles on handling bagged ma-

materials and boxcar loading.—H. L. Bradley, Plant Superintendent, Food Machinery and Chemical Corp., Newark, Calif.

FLOW has periodically featured bag-handling operations, which involved such divergent materials as coffee beans, pigments and cement. The present issue presents an article with another set of problems in connection with this subject. See "A Pallet Program For Materials In Bags and Drums."—Ed.

To FLOW:

Plywood And Veneer

We acknowledge your recent letter and the enclosed reports on handling plywood and veneer. Many thanks for your cooperation in sending us this information. No doubt the problems associated with the handling of these materials are similar to our own.—Paper Makers Proprietary Limited, Melbourne, Australia.

To FLOW:

Crane Specifications

In the September issue of *FLOW* Magazine there is an article titled Specifications on Electric Overhead Cranes for Standard Service, Part II, that we are interested in.

On Page 43 under the heading of Beam Girders there is shown a formula which appears to be incomplete. Could we obtain more specific information in regard to this formula.—A. E. Hall Jr., Engineering Dept., Neptune Meters Limited, Toronto, Canada.

Reader Hall was referred to the Electric Overhead Crane Institute, which released the Specifications for publication.—Ed.

To FLOW:

All In One Place

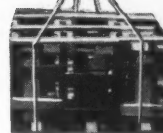
Please send us one of your *FLOW* binders so that we may compile our current copies of *FLOW* in one binder.—J. P. Hardman, Mercury Conveyor, Inc., Hillsdale, N. J.

A few binders are still available to readers at \$1.00 each.—Ed.



Presents

the 5th ECONOMY!



- ① LOW OPERATING COSTS
- ② REDUCED MAINTENANCE
- ③ NO COSTLY REPAIRS
- ④ MINIMUM YARD SPACE
- ⑤ LOW INITIAL INVESTMENT

■ Coles Cranes with their great maneuverability, high performance and low initial investment enable users to attain maximum production with minimum overhead and labor costs.

■ Taking all these facts into account—it is no wonder—why Coles Cranes reduce Material Handling costs—and "Prove their Worth"... where costs count.

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PLATFORM AND
FORK LIFT
TRUCKS
WOODEN PALLETS**

THIS BARREL RACK saves space, makes for safety, facilitates "first in, first out" handling.

Centralized Receiving for Supplies

There has been a mushrooming of Quonset huts on industrial plant sites around the country. Many of these are serving as storerooms for operating supplies—a function which too frequently is left to take care of itself, with many consequent headaches. While the curved roofs create unused space, the inexpensive construction is amply justified by alleviating serious storage problems. Here is how Oneida Ltd. is using its Quonset hut.

MANY plants are faced by difficulties in connection with the receiving, storage, and disbursement of operating supplies. The situation is aggravated when the volume received is large and the number of items numerous. This is frequently the case.

With no planned, centralized storage area available, supplies are apt to be stored pell-mell in processing departments, in rented space, and wherever room can be made. Such a "storeroom" is usually scattered over miles, which results in difficulties in record keeping, order assembly and inventory. You are apt to think you have three drums, or 500 lb., or 10 cartons of a cer-

tain material on hand at a particular location, but then find out that those supplies were used up some weeks ago.

A Place for Operating Supplies

To avoid the sundry headaches of unplanned handling of supplies, our company authorized the construction of a 60' x 230' Quonset hut which was to serve as a centralized storeroom. The hut is centrally located in a north-to-south direction in relation to the depart-

ments which it is serving.

All operating supplies are received at the new facility, usually at the depressed truck dock which is near the center of the 230 ft. length of the building. This arrangement was planned to avoid long hauls to the storage locations for the numerous types of supplies.

Space within the building is allocated on the basis of the volume of receipts. All "solid stack" items are palletized and stacked solidly from the center aisle to the side of the building. Items which are dispensed in small quantities are kept in what is called a "selective group", with cross-aisles maintained
(Turn to page 24)

By W. D. ACKLEY

Industrial Engineer,
Oneida Ltd., Oneida, New York



INTERLOCKING TUBULAR RACKS for large flat stock. Fork truck picks off rack section

The last word in . . .

RECEIVING, INSPECTION, STORAGE OF RAW STEEL

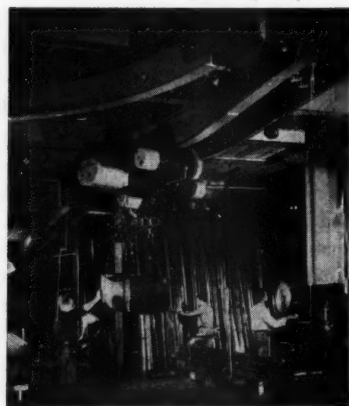
The Burroughs Adding Machine Co. listed faster and more efficient handling of more material in less space as main requisites for its new raw steel receiving and storage department. The successful execution of this ambitious program may shed light on some of your own receiving problems.

THE Burroughs Adding Machine Co., Detroit, is one of the world's leading manufacturers of

SHELF-TYPE RACKS, "A" RACKS, TIERING-TYPE RACKS, PLATFORM TRUCKS, FORK TRUCKS, MONORAIL, BRIDGE CRANE

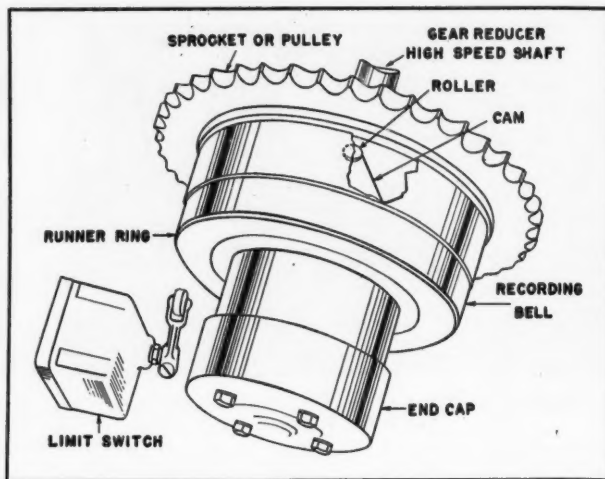
business figuring and accounting equipment. The company's products are distributed through 135 company-owned and operated sales outlets in the United States and

POWERED HOIST moves bundles of flat stock to temporary storage. Note monorail switch.



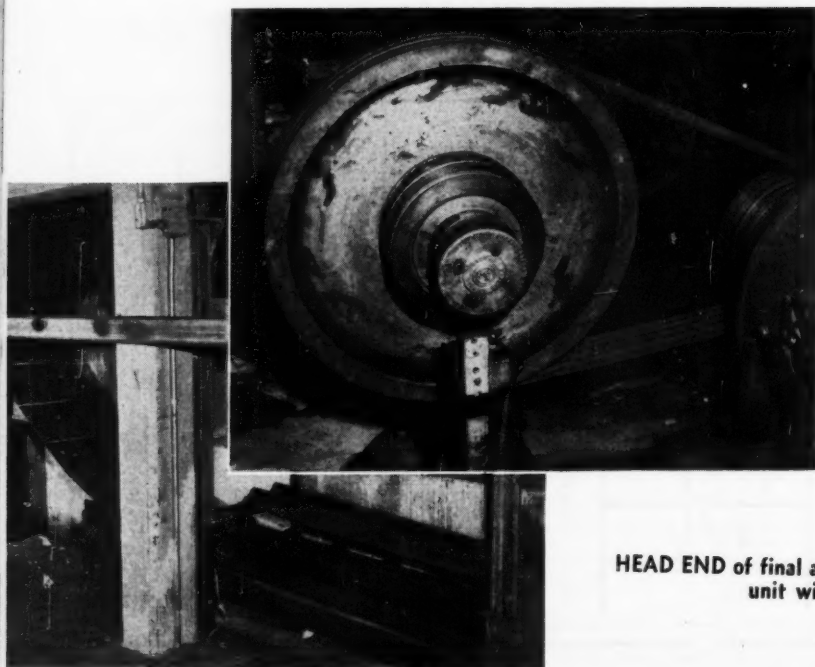
DETAIL DRAWING shows
Overload Safety Cut-Out in re-
lation to conveyor drive pulley.

By **K. R. PARKER**
General Plant Engineer,
Packard Motor Car Co., Detroit



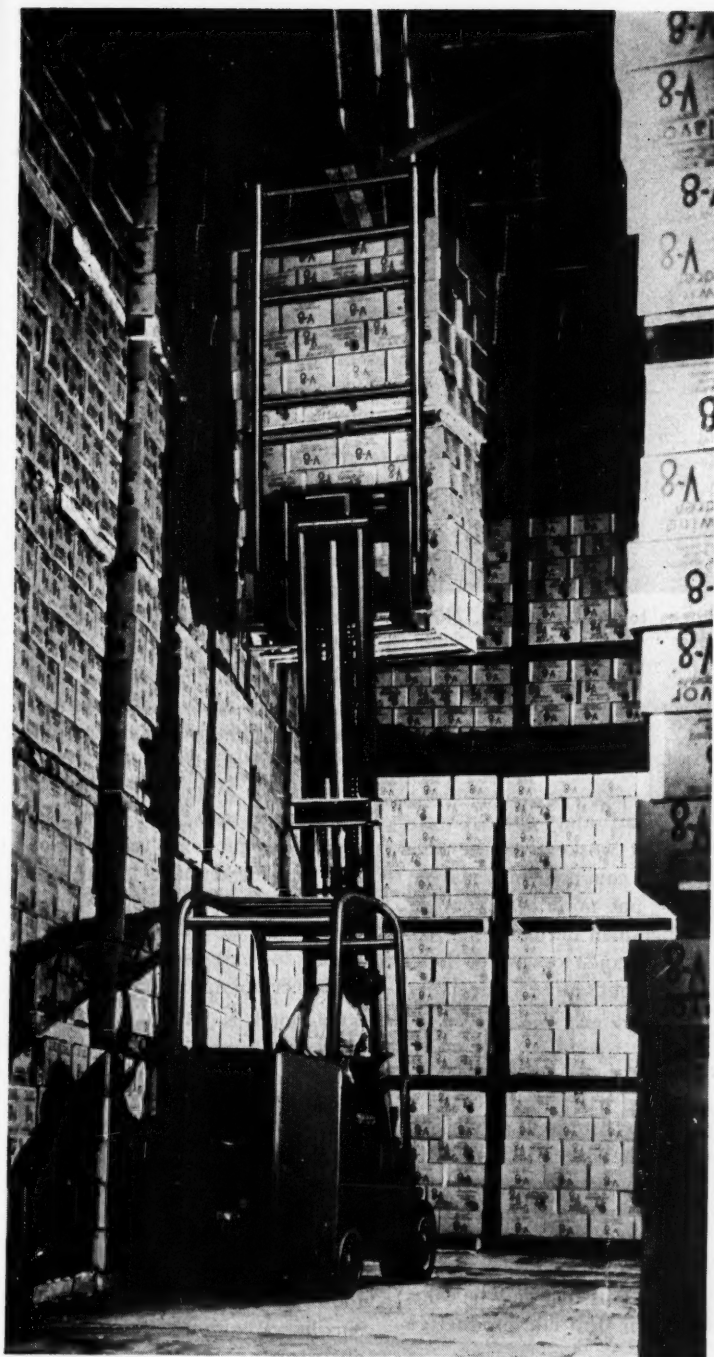
Overload Cut-out cuts down time from minutes to seconds

The cost of downtime demands controls that will keep such disruptive stoppages to an absolute minimum. Such automatic controls as overload safety cut-outs on conveyors not only prevent damage from overloads but also minimize production loss. This report shows how cut-out switches at the Packard Motor Car Co. reduce downtime from minutes to seconds.



HEAD END of final assembly conveyor, left. Insert shows drive unit with cut-out as integral part.

THE prevention of overload to a conveyor drive unit is recognized as a vital problem. The criterion of such a device is that it will (1) cut the power fast enough so that no damage will



HIGH STACKER

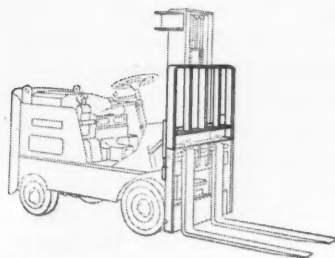
saves warehouse space

Towmotor Fork Lift Trucks stack materials and products of every size, shape and weight, doubling and tripling storage areas, freeing valuable floor space. With certain models, loads can be lifted 65' without raising mast . . . ideal for low ceiling areas . . . simplifying the task of moving supplies "in" and "out." Compare Towmotor with any other fork lift truck and you will see why Towmotor-Engineered features make every **Mass Handling** job easier, faster, safer. 10 models plus standard and specially designed accessories handle loads from 1500 to 15,000 lbs.—a Towmotor for every job. Write for a copy of "Handling Materials Illustrated." Towmotor Corporation, Division 8, 1226 E. 152nd St., Cleveland 10, Ohio. Representatives in all Principal Cities in U. S. and Canada.

every handling job is easier with TOWMOTOR MH!



FORK LIFT TRUCKS and TRACTORS

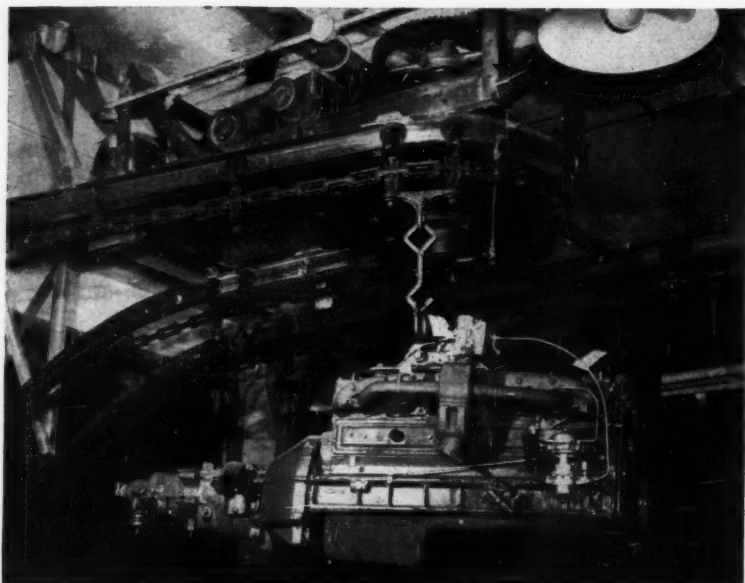


EXTENSION BACK REST

—another Towmotor Efficiency Feature

An extension accessory for the vertical carriage frame. Facilitates handling of unusually high multi-unit loads with normal stability and safety. Can be attached or removed in a few seconds.

RECEIVING • PROCESSING • STORAGE • DISTRIBUTION
FLOW • DECEMBER, 1949



OVERHEAD CHAIN CONVEYOR delivers engines to final assembly. Note safety cut-out, arrow.

result to the equipment and (2) permit quick conveyor resumption.

Downtime in Seconds, Not Minutes

Within the past 18 months Packard has progressively installed overload safety cut-outs on more than 100 of the conveyors, which have replaced the standard shear pin. The unit is attached to the drive unit, and when an overload is encountered the unit actuates the stop button and shuts off the line. It is then only necessary to press the "on" button to resume the conveyor flow. The device may also be incorporated with warning signals or lights on a master control board.

Formerly, it was necessary to call maintenance to replace the shear pin and get the line back in operation. If the cause of the overload was not corrected (it is sometimes difficult to find the exact cause), the new pin snapped and the work had to be done over again. A motto in our plant was "run to the installation which is down and you can walk back." This was seriously prescribed with regard to conveyors since often the men had to come from distant parts of the

plant while operators stood around idle.

The overload safety cut-out is so designed that workers on the line can start the conveyor in a matter of seconds, not minutes. Nor are maintenance men normally needed for this job, and we go for long periods without any appreciable lost time.

Factors Causing Downtime

It will be well to look at various aspects of the overload problem. When conveyors are used in sequence with hundreds of persons stationed along the lines, a 10-minute delay in their operation can be very costly. This cost may be computed both in the non-productive

time of operators and in lost output of the product itself. The focal point of an entire plant is the final assembly conveyor. If this conveyor stops for any length of time, other conveyors behind it must usually be stopped as well.

This is especially true at Packard where many lines feed the final assembly conveyor. While other lines in the plant are important to production, these can be down temporarily without serious consequences, because parts will be moved by other means.

Moreover, a certain float is usually maintained between departments so that immediate repair of inter-departmental conveyors is not as vital as in the case of assembly lines. Lost production in a one-product company like ours cannot ordinarily be made up.

Downtime of conveyors, rarely the result of mechanical defects in the equipment, is often caused by an overload exerted on the driving mechanism. Some type of cut-off device is necessary on most conveyors to prevent the overload from causing damage to the drive unit. In the case of serious damage to a large installation, the time needed for extensive repairs would have a crippling effect.

Overload is caused by foreign material dropping into the conveyor, or other interference with its travel. Specific reasons may be listed as follows. 1. Materials which are used during final assembly and which are removed when the car is completed—clamps, for example. 2. Small production parts such as bolts, nuts and washers. 3. Hand tools used during assembly. 4. Auxiliary equipment which may obstruct the natural travel of the conveyor. 5. Hooks or other extensions on the conveyor which catch on surrounding objects.

While the elimination of all conveyor downtime is both impossible and impractical (in the case of overloads), we believe we have struck a balance between preventing overload damage and keeping non-productive time of operators and equipment at a minimum.

Better, Bigger Directory

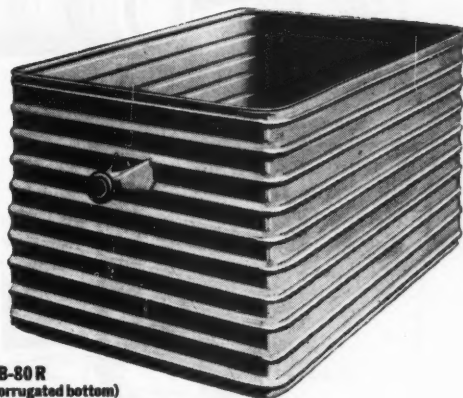
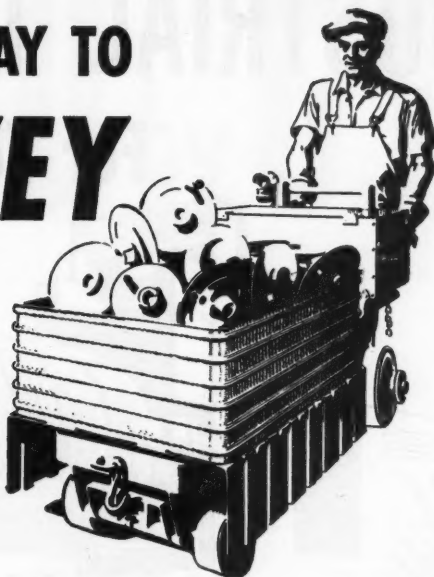
New, improved features have been incorporated in the 1949-1950 FLOW Directory. More definitions and sketches; revisions for easier and more complete reference. Copies are \$5.00 each. Send your order to the FLOW Directory, 1240 Ontario St., Cleveland 13, Ohio.

YOU'LL FIND IT WILL PAY TO **TRUSCONVEY** YOUR PLANT MATERIALS

TRUSCONVEY means the quick, Johnny-on-the-spot movement and delivery of parts and materials—from neat, orderly, easy-to-get-at points throughout your plant—with the aid of strong, efficiently-designed Truscon Steel Boxes and Skid Platforms.

Now your plant must be geared to production schedules that mean *faster* action, *less* waste motion, *more* efficient work in each and every one of your manufacturing steps.

- You can help meet these new requirements of your plant by permitting us to study your handling operations and requirements. We then can make well-planned recommendations exactly suited to your needs, embodying Truscon Steel Boxes and Steel Skids designed to fit your individual needs.
- Throughout America, Truscon Materials Handling Equipment is simplifying operations and speeding production. Its ability to stand up year after year despite hard service and adverse conditions, has proved that in the long run it is the cheapest and most profitable equipment.
- Learn to say **TRUSCONVEY**—learn the many benefits you will receive from Truscon Steel Boxes and Steel Skids—write for literature.

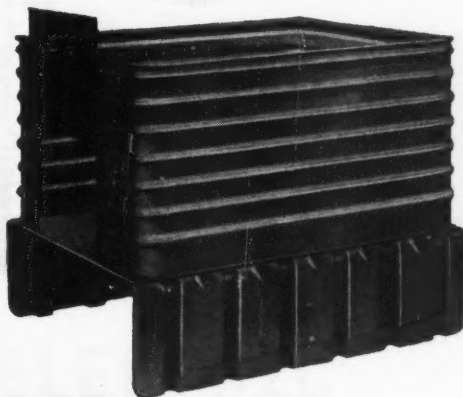


Type B-80 R
(with corrugated bottom)



Investigate TRUSCON Foundry Flasks

Light weight . . . durability . . . strength where strength is needed . . . easily rammed and shaken out . . . these are features of economy and production you get in TRUSCON foundry flasks. Write for descriptive literature on complete line.



Type PB-650
(with flat bottom)

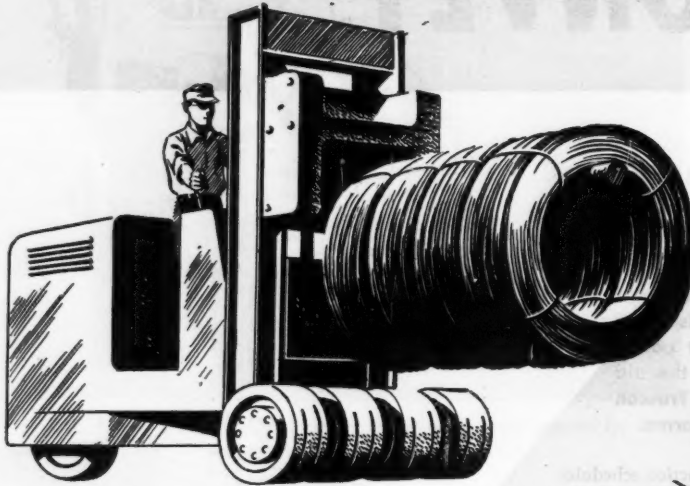
Truscon

MATERIALS HANDLING EQUIPMENT
Truscon Steel Co., Pressed Steel Division, 6100 Truscon Avenue,
Cleveland, Ohio. Subsidiary of Republic Steel Corporation.

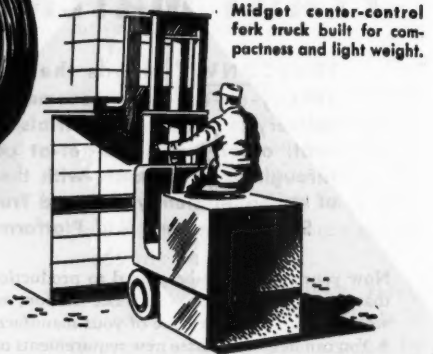
YOU'LL FIND IT WILL PAY TO **TRUSCONVEY** YOUR PLANT MATERIALS

INDUSTRIAL TRUCKS

For Feathers or Forgings...



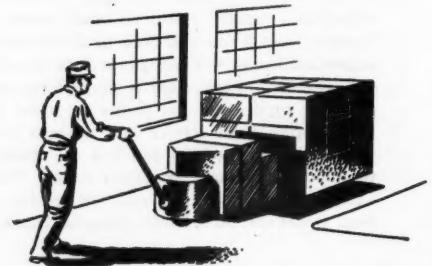
Heavy-duty ram truck built to handle loads up to 15 tons.



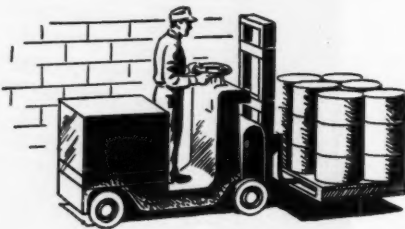
Midget center-control fork truck built for compactness and light weight.



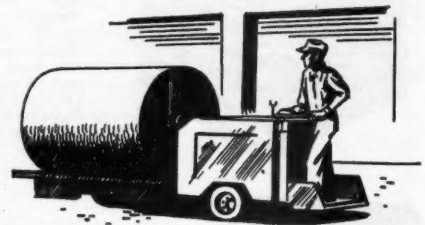
High-lift platform truck



Powered hand truck

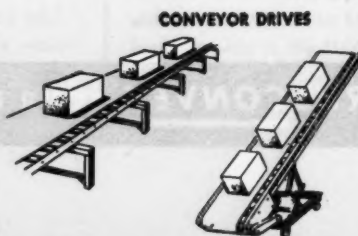


Fork truck



Low-lift platform truck

*Everything
electrical
for
MATERIALS
HANDLING*



CONVEYOR DRIVES



CRANE DRIVES

POWERED by G.E.

TO HELP CUT YOUR MATERIALS HANDLING COSTS

Operating economy, long life, noiseless operation, flexibility of control—these are the major advantages of battery-powered trucks recognized by all industry. In fact, today, the demands of low-cost production make the use of these economical handling devices a practical necessity.

An "old-timer" in this field, General Electric manufactures a complete line of electric equipment for industrial trucks—motors and control for all types and sizes of battery trucks . . . and chargers, both rectifier and rotating.

Electrical components can make or break a battery truck. It will pay you to specify equipment of proven quality. Be certain that the trucks you choose are G-E equipped and then insure their efficient operation with G-E battery chargers. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

SEE the latest techniques and equipment in this new film



As a service to industry, General Electric has produced an unbiased, authoritative movie* covering in detail the latest techniques and equipment used in the materials handling field. Write or call your equipment supplier or G-E representative and have this film made available to you and your staff—without cost or obligation.

*Part of G.E.'s MORE POWER TO AMERICA program; film is titled "Materials Handling—In Receiving, Warehousing and Shipping."

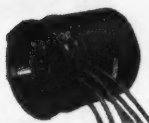
GENERAL ELECTRIC

668-72

HOIST DRIVES



INDUSTRIAL TRUCK DRIVES



NEW BT Truck Motor. Designed specifically for the battery-truck industry this high-efficiency, small-diameter, round-frame motor withstands heavy overloads and permits dependable, long-life service.

NEW Master Switch. This four-point foot- or hand-operated master switch is enclosed in a dust-tight cast-iron case which thoroughly protects the contacts from contamination—providing long life and reliable operation.

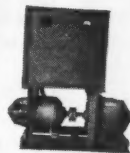


Magnetic Control. Sturdy contactors specially designed for battery-truck service enable this control to provide smooth, trouble-free performance. Equipments for larger trucks may be designed to include time control, acceleration, anti-plugging, and dynamic braking.

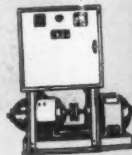


BATTERY CHARGING EQUIPMENT

G.E. offers rectifier or motor-generator type charging units to meet your particular requirements—multiple-circuit units for use in a central charging room or single-circuit units for on-the-job charging. All equipment provides precise control for automatic charging to suit individual battery characteristics.



INDUSTRIAL TRUCK DRIVES & BATTERY CHARGERS



INSTITUTE, SOCIETY AND ASSOCIATION CHAPTER ACTIVITIES

THE Caster and Floor Truck Manufacturers' Association has elected the following as officers for 1949-50. President, A. B. Anderson; vice president, G. K. Mullholland; treasurer, Donald B. Anderson. H. P. Dolan continues as secretary. Directors of the Association are: C. Carter Bond, Bond Foundry & Machine Co.; W. G. Reyeroft, The Bassick Co.; G. K. Mullholland, Saginaw Products



A. B. Anderson

Corp.; L. C. Conner, Orangeville Mfg. Co.; Geo. J. Hanhauser, Fab-Weld Corp.; and C. H. Strauss, Ironbound Box & Lumber Co.

THE Indianapolis Chapter of the American Material Handling Society furnished the speaker and conducted a material handling section at the Central Indiana Safety Conference, held at the Claypool Hotel, Indianapolis, November 22. J. O. Abney, supervisor of standards at the Chevrolet Commercial Body Division, General Motors Corp., Indianapolis, addressed the section on "Stop, Look and Listen for Safety in Material Handling." On December 14, W. J. Dernberger,

director of material handling operations, Ford Motor Co., will represent the chapter at a cost reduction conference to be held by

their Determination"; "Statistical Approach to Industrial Problems"; and "Material Handling—Trade or Profession."

Presidents of Local Chapters



D. W. Pennock
Syracuse Chapter,
American Material
Handling Society



C. F. Jessee
Dallas Chapter,
American Material
Handling Society



Lyman Nivling
New England Chapter,
American Material
Handling Society



Roy Stevenson
Northeast Ohio
Chapter, Material
Handling Institute

the Society for Advancement of Management at the Lincoln Hotel. Dernberger's topic will be "Efficient Material Handling Reaps Profits". Officers of the Indianapolis Chapter are D. C. Rhodes, president; R. E. Pigg, vice president in charge of programs; L. O. Marschke, vice president in charge of membership; S. C. Jarrell, secretary-treasurer. Director to the American Material Handling Society is W. W. Phillips.

PLANs for the Second Annual Purdue Material Handling Conference were formulated at a meeting of the program committee. The theme "New Approaches To Material Handling Problems" was adopted and a program was developed to present new methods and techniques. The dates of the meeting are February 20 and 21, 1950. One paper to be presented will be "Profits in Short-Run Production by Efficient Material Handling." Other subjects to be covered are "Cost—Methods of

THE Material Handling Institute held its membership meeting at the Hotel Cleveland, Cleveland, October 14. Forty-nine persons were in attendance. The annual meeting of the Institute will be held at the Hotel Commodore, New York City, on December 6. J. H. W. Conklin, president of the group, appointed a nominating committee for a new slate of officers composed of Gordon J. Berry, chairman, John G. Bucuss, E. C. Hamm and W. G. Reyeroft.

THE Detroit Chapter of the American Material Handling Society Inc. held its first dinner meeting of the fall on Sept. 27. A.C. Heathcote, director of project engineering for Massey-Harris Co., Ltd., Toronto, gave a resume of problems in converting obsolete plants for economical material handling. A color movie, "Combine Cavalcade" was shown. The October 27 meeting featured L. C. Backart, chairman of the board of directors, Rapids-Standard Co., as speaker. He talked on "Manage-

ment's Contributions to Material Handling". On November 28, W. B. McClelland of the Clark Equipment Co. talked on "Gasoline vs. Electric Power for Industrial Trucks".

E. C. McCLEARY, director of materials, Willys Overland Motors, Inc. addressed the September meeting of the Toledo Chapter of the Material Handling Institute, Inc. His subject was "What Management Wants to Know About Material Handling." McCleary emphasized that management wants material handling people to reduce costs in any way possible. As specific suggestions he advised listing jobs in order of importance, describing present methods, pre-testing proposed methods, recording savings, and reporting to management before installation of new systems. He also advised obtaining approval by brief factual reports with a liberal use of photographs to illustrate new and old methods.

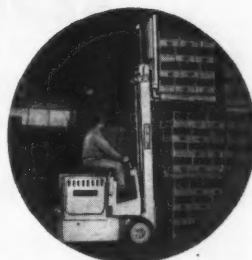
The October meeting was addressed by **A. E. Aukens**, consulting engineer, who spoke on "Engineering Problems in Material Handling". Aukens stressed the fact that most problems are of an application engineering rather than a design or structural nature and urged material handling people to be aware of this fact. The November meeting featured a panel discussion of specific material handling problems submitted by members and guests. **G. R. Larson**, A & P Tea Co., was moderator of the panel composed of five of the Toledo Chapter's members. Officers in the Northwest Ohio group are: president, **M. A. Cox**; vice president, **N. W. Franklin**; treasurer, **I. A. Degner**; and secretary, **Ed Southworth**.

THE annual meeting of the National Society of Professional Engineers will be held in Houston, Texas, December 8 through 10. **Mason G. Lockwood**, president of

Handling Simplified in Large Foods Warehouse—"Fits like a glove" into our handling operations. That's how this large food company describes the Mercury "Jeep."

This modern, one-story warehouse, designed for maximum storage, enables the Mercury "Jeep" to utilize its *compact size, power and easy maneuverability* to the utmost. 2000 lb. pallet loads are tiered to 18 foot heights... materials are handled, hauled and stacked with ease. *All* by one man and the Mercury "Jeep."

Learn how these economies can serve you. For on the spot consultation, ask a Mercury Sales Engineer to call.



Mercury "Jeep" quickly stacks 2000 lb. pallet load.

One Man and a Mercury "Jeep"

DO THE JOB!



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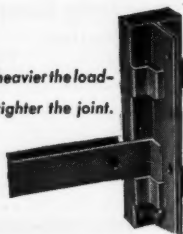
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The heavier the load—
the tighter the joint.



Clears the way for **MATERIALS MOVEMENT**

WEDGE-LOCK Steel Shelving gives you room for wide, unobstructed aisles that help traffic move fast. It allows you to pack a lot of inventory in a little space, because WEDGE-LOCK bears far greater weight than any other shelving, yet requires only a minimum of floor area.

Exclusive WEDGE-LOCK construction is strong, tight and sway-proof. Heavy loading merely increases overall rigidity. No gussets or sway braces needed. Shelves are clear, easy-to-get-at . . . free from obstructions that might impede materials movement. Specify Berger WEDGE-LOCK Steel Shelving for a smoother, faster material flow in production areas, in receiving and shipping rooms, in assembly and inspection departments as well as in stockrooms. Write for literature and full information.



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DIVISION
REPUBLIC STEEL CORPORATION
CANTON 5, OHIO**

Rack Type Steel Shelving for Long Parts • Steel Bar Racks • Convertible Steel Shelving • Flexi-Bilt Bin Units
Tool Room and Shop Equipment • Stacking, Nesting and Scoop Front Boxes • Steel Lockers • Steel Office Equipment

the Texas Society of Professional Engineers is the general arrangements chairman. The group will confer the title of "the greatest engineer in our time" on former president Herbert Hoover. The honor will be accepted on his behalf by Jesse Jones, former presidential cabinet member.

FIFTY-ONE members and guests attended the October meeting of the Northeastern Ohio Chapter of the Material Handling Institute, Cleveland. The speaker was James L. Hibbard, B. F. Goodrich Co. Hibbard's talk covered the role played by rubber in the material handling field. He outlined the present-day diversification of rubber products and their relationship to all types of material handling equipment. He indicated the various compounds used in both solid and pneumatic tires, each compound for a specific application. In addition, the question as to the size of tire for most economical operation was stated as a major point to be answered.

President Roy Stevenson appointed the following committees. The executive committee is made up of George McManus, A. E. Aukens, Maurice F. Degley, E. M. Abramson, Walter H. Jaynes and the present officers of the chapter. The membership committee includes E. M. Abramson, Clyde Le Beau, J. A. MacLellan, and H. L. Van Keuren. The publicity committee is headed by Walter H. Jaynes, the program committee by Frank C. Wier.

THE Poor Richard Club was the scene of the October and November meetings of the Material Handling Society of Philadelphia. Those in attendance at the October gathering heard F. William Kaercher of the Link-Belt Co., whose subject was coal handling. The speaker at the November meeting was Floyd E. Bliven of the General Electric Co., who discussed scrap handling. The Philadelphia group has scheduled

a Christmas party for its December meeting. The event will be open to members only.

OVER 100 members attended the September meeting of the New England Chapter of the American Material Handling Society at the Hotel Kenmore, Boston. Speaker was George Hedden-dorf of Babson Institute, whose subject was "Factors in Cost Determination of Material Handling". Preceding the meeting, moving pictures of material handling equipment in action were shown. At the October 18 meeting, Chapter President Lyman Nivling introduced R. C. Hood, assistant manager, factory engineering of Carrier Corp., who spoke on "Material Handling Problems in the Air Conditioning Industry." The November meeting featured an inspection and demonstration of the material handling system in use at the Norton Co. in Worcester, Mass. The company manufactures abrasives. New England chapter officers are Lyman Nivling, president; James Gallery, vice president; Sears L. Hallett, secretary; Thomas G. Tyman, treasurer.


THE North Texas Chapter of the American Material Handling Society has elected the following officers for the coming year. C. F. Jessee, president; F. T. Towne, vice president and treasurer; and E. F. Phelps, Jr., secretary. The executive committee includes Joe P. Bowlin, Jack A. Mathews, W. A. Cowan, Roy C. Kimball, Rip Nichols and Willis Currens.

THE November meeting of the Midwest Material Handling Society featured a talk by E. H. Ashley, manager of packaging development, General Electric Co. Members and guests at the December 13 meeting will tour the Chicago plant of Johnson & Johnson. Newly elected officers in the Chicago handling society are: president, Robert C. Brady; executive vice president, J. S. Williams; secretary, A. Buy, (Turn to page 50)

***CLARK** materials-handling methods and machines constitute a team that **CURBS** wastes common to most handling operations. When and where this team goes to work, savings start **CLIMBING** as of "right now," and break-even points fall quickly to "breathe-easy" points. You can't beat this team, but you can join it to bring down production **COSTS** to a comfortable level.

.....
How several blue-chip industries are curbing costs to the benefit of their profits is told and illustrated in "Material Handling News," the interesting "tell how" magazine and in Clark's "show how" motion pictures. You can use both to advantage simply by requesting them on your business letterhead.

CLARK ELECTRIC AND GAS POWERED
FORK TRUCKS
AND INDUSTRIAL TOWING TRACTORS



INDUSTRIAL TRUCK DIV., CLARK EQUIPMENT COMPANY BATTLE CREEK 13, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD
AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS



THESE CARBOYS for nitric acid are secured by cord through handles for stability of load.



FORK TRUCK loads heavy items on platform truck for delivery from centralized storeroom.

CENTRALIZED RECEIVING . . .

(Continued from page 11)

for access to the different kinds of items.

In general, we stack the goods up to a maximum height of 12 ft., which, depending on the height of the individual pallet loads, may be two or five pallets high. Palletization is used wherever possible, except materials in steel drums and very small items that are stored in bins. Drums are stored in barrel racks, as shown in one of the exhibits.

The drums are rolled out of the delivery trucks and then stored by fork truck in the angle-and-channel rack. Each section is one wide, four deep and four high—a total of 16 drums per section—or 96 for the six sections that make up the entire rack structure. These drums contain various heavy oils used in processing. Since they are usually dispensed by the single unit, the rack method is well designed for their handling. The open rack construction also enables us to observe the first-in, first-out method.

Method for Steel Carboys

As is usually the case, there is bound to be a problematic type of supply that requires special handling. In our case, this item is nitric acid in melon-shaped steel carboys. The 8½ gal. units weigh about 100 lb. each, with 16 of them constituting a load for a 48" x 48" pallet. These carboys have a rigid handle on one side, but are not too satisfactory for tiering purposes owing to the base which is smaller than the bulging center. In order to make a stable load for tiering purposes, we turn the carboys so that all handles are "in". A length of heavy string is then run through the handles, as shown in one of the photos, and hauled taut. This provides a stable foundation for supporting other pallets. It also prevents single carboys from falling off.

The production departments send

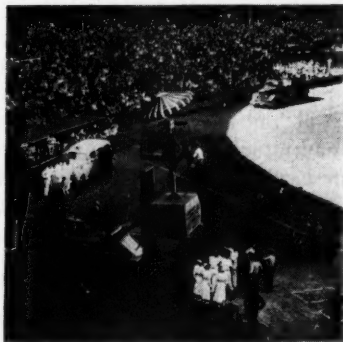
a requisition for supplies to the stores office. Orders for the heavier items are assembled adjacent to the receiving platform, while lighter ones are usually taken from the bin locations to the delivery vehicle. Loads are delivered by a low-lift platform truck, which is maintained by the central storeroom along with a 2000 lb. capacity fork truck. The exhibits show various operational views.

It should be mentioned that the extensive Quonset hut also houses our charging department for storage batteries.

Several improvements have resulted from our centralized operation for receiving, storing and disbursing supplies, as follows. 1. Delivery vehicles no longer have to be sent to far-flung locations in order to assemble an order. 2. Better housekeeping. 3. Vastly improved inventory control. 4. Better servicing of production departments.

(This is the first of three reports on various material handling phases at Oneida Ltd. Two additional discussions by W. D. Ackley, to appear in an early issue, take up handling methods in production and packing.—Ed.)

117 DAYS IN THE AIR—Baseball's most ardent rooter, Charlie Lupica, is shown descending from a stand after spending 117 days atop a flagpole waiting for the Cleveland Indians to reach first place (which they did not make). At the final home game of the season in Cleveland, Lupica was brought to the



Cleveland Stadium via a standard model 15,000-lb. capacity fork truck. During the truck's travel from Lupica's east side perch, it was necessary to lift overhead electrical lines of the city's surface transportation system. Once in the stadium, the stand was elevated to a height of 35 ft., then lowered to allow the ladder to reach the stand.

Special-Purpose SYSTEMS

designed to meet individual
requirements, including:

CONVEYORS

AUTOMATIC PALLET LOADERS

PNEUMATIC TUBE SYSTEMS

BLOWERS AND EXHAUSTERS

INDUSTRIAL VACUUM

CLEANING SYSTEMS



Write for bulletin. Our technically-
trained representatives are available
for consultation.

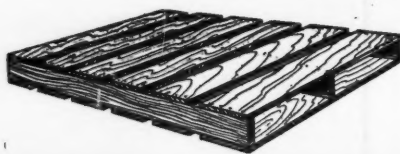
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Branch Offices in Principal Cities

ON THE



PALLET

NEWS • VIEWS • TRENDS

IT is now understood that there will be no National Material Handling Exposition in 1950. The next scheduled show will be held in 1951, probably in Chicago, in either the late spring or early fall. The Material Handling Institute is going ahead with plans for this exposition and will announce details as soon as they are formulated.

THE Gould Storage Battery Corp., Trenton, N. J., has combined under one roof at 244 Fremont Street, San Francisco, the facilities that were formerly at three different locations for sales, service, and warehouse activities. The new office will head up the Gould Western Region, which now offers sales and repair services in San Francisco, Los Angeles, Portland, Seattle and Denver. C. H. Hart, formerly District Manager in San Francisco, will now manage the entire western region. He has many years experience, both in the San Francisco and the Pittsburgh area, as a specialist in battery applications in the material handling and mine-haulage fields.

THE American Society of Mechanical Engineers and the Society for the Advancement of Management will be co-sponsors of the conference program on plant maintenance which will be held concurrently with the Plant Maintenance Show at the Auditorium, Cleveland, O., Jan. 16-19, inclusive. This was announced by Clapp and Poliak, Inc., the exposition management. The Cleveland Engineering Society will be hosts at a dinner for visitors.

Topics scheduled for discussion include: "Maintenance Organization and Management;" "Budgeting the Maintenance Operation;" "Selection and Upkeep of Lighting Equipment;" "Upkeep of Motors, Controls and Distribution Equipment;" and "Using Electrical Instruments in Maintenance." Additional topics are "Upkeep of Floors, Walls and Roofs;" "Protection, Decoration and Cleaning of Surfaces;" "Sanitation and Housekeeping;" "Lubrication;" "Application of Service Equipment;" "Protecting the Plant," and "Protecting the Worker."

More than 100 exhibitors will give demonstrations of machinery, materials and methods for reduction of costs in plant maintenance.

A RECIPROCAL training program involving Naval Supply Corps officers and industrial person-

nel engaged in warehousing and material handling functions is being conducted at the Naval Supply Center in Oakland, California. The program provides for Navy personnel, both civilian and military, and industrial executives and operating personnel to be trained in methods of receiving, storing and issuing material, both in naval and industrial procedures.

MICHIGAN State College has started its first Annual Industrial Engineering Conference. Jervis C. Webb, Jervis B. Webb Co., Detroit, presented the story of conveyors. He opened with a discussion of the need of this type of equipment and showed two movies titled "Careers in Conveyors" and "Pacemakers for Production." Additional topics covered by Webb were plant layouts for paper making, foundry sand and mold handling, and other industrial conveying systems.

A NEW plant devoted to the manufacture of Exide batteries was recently opened in Atlanta, Ga., by The Electric Storage Battery Co. The plant is located at 1246 Allene Avenue, S. W. The official opening was observed with a luncheon in the Capital City Club, with Elbert P. Tuttle, the president of the Atlanta Chamber of Commerce, presiding. The new plant will have a capacity of from 1200 to 1400 automobile batteries. In addition, facilities are provided for the assembly of industrial batteries.

RAYMOND H. MARTIN, plant and sales manager of The Bassick-Sack division of The Bassick Company, died recently at the age of 55. Martin was widely known in the furniture industry. He was made head of the furniture hardware plant of Bassick-Sack, Winston-Salem, N. C., in 1948 following more than 25 years with The Bassick Company at Bridgeport, Conn.

AN ultra-modern \$2,500,000 shipping center which employs many new methods of material handling, and which will cut down from days to hours the time required to assemble and ship an order, has been opened by Johnson and Johnson. The new shipping center, located just off New Jersey Highway 27 between Metuchen and New Brunswick, is set on a 58-acre plot, and contains 207,000 gross sq. ft. of floor space. This new unit brings into being an entirely new

(Turn to page 53)

MEN IN THE NEWS

EDWIN C. ELSNER, president of the CJW Corp., has announced the election of two new officers. General sales manager E. Van Vechten was elected vice president. James L. Adams was elected secretary-treasurer.

APPOINTMENT of Commander Wm. Van C. Brandt, of Philadelphia, to membership on the Munitions Board to serve on the Packaging, Storage and Materials Handling Industry Advisory Committee, has been announced. Commander Brandt is managing director of The Electric Industrial Truck Association. He will represent the association on the committee, and has been also designated as a member of the materials handling sub-committee of the parent committee.

W. M. E. MADDEN, recently elected vice president, has now been made general sales manager of the George Haiss Mfg. Co., Inc., division of the Pettibone Mulliken Corp. This announcement was made by Mr. E. J. Seifert, president.

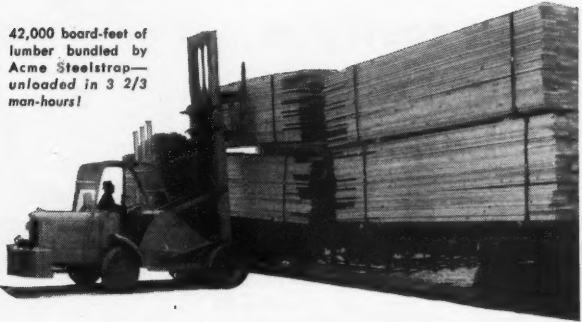
THE following personnel changes were announced by C. H. Collier, Jr., eastern truck sales manager for the Hyster Co. at the Peoria, Illinois factory. John Mitchell, formerly retail salesman in the Hyster Chicago store, has been promoted to the position of district manager of truck sales for the northeastern section of the country. John Cusick has been named lift truck sales district manager, responsible for the central portion of the United States. Also named to positions as district managers are W. J. O'Brien in the southwestern territory, C. E. Houston in the northwest district and Fred Schultz in the southeastern part of the United States.

SAGE EQUIPMENT CO., Buffalo, has announced the appointment of Phillip A. Kessler as chief engineer. Kessler will supervise production, purchasing and estimating in addition to his duties as chief engineer. Kessler was formerly associated with West Bend Equipment Company of West Bend, Wisconsin.

PHILIP B. NILES has been elected a vice president of The Yale & Towne Mfg. Co., it was announced by Gilbert W. Chapman, president. Niles joined Yale & Towne on November 7, and will devote his attention to marketing and to the development of executive personnel throughout the company. He has been public relations director for the Owens Illinois Glass Company, Toledo, since early in 1948.

Shippers and Receivers SAVE with ACME STEELSTRAP

42,000 board-feet of
lumber bundled by
Acme Steelstrap—
unloaded in 3 2/3
man-hours!



Packaging with Acme Steelstrap can save time, money, and materials for 9 out of 10 shippers—and for receivers, too! Take the case of Ekco Products Company of Chicago.

Ekco used to spend 38 to 45 man-hours unloading 25,000 board-feet of lumber. Then their supplier started bundling shipments with Acme Steelstrap.

The next car was unloaded in 4 1/2 man-hours. And the following car—with a record load of 42,000 board-feet—took only 3 2/3 man-hours!

Whether you ship by carton or carload, you want to cut costs, protect your shipment against damage and pilferage, and build customer good will. And the way to do it is to box, bale, bundle or crate your product with Acme Steelstrap.

Mail the coupon today for free booklet of case studies. Or, by simply checking the square indicated on the coupon, you can have an Acme Shipping Specialist make a free analysis of your problems.

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KEEP manual handling to the minimum and you cut handling costs. Whatever has to be moved — materials loose or in containers, units, assemblies, castings or cartons — you can move it faster — at lower cost on conveyors.

An experience record of more than 40 years — serving all classes of industry and business — heavy or light manufacturing — handling steel or cosmetics — qualifies Standard to be of service to you.

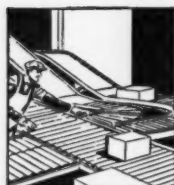
Call on Standard for any conveyor requirement—a complete engineered

system — a portable unit — a light, portable section of roller or wheel conveyor.

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substantially. Further information
without obligation.

GEMAR ASSOCIATES
Greenwich, Connecticut

RECEIVING, INSPECTION, STORAGE OF RAW STEEL . . .

(Continued from page 13)

convenient maneuvering for powered rolling equipment. A wide variety of racks, designed for specific types of stock, facilitates fast storage and removal. Modern handling equipment does the heavy work—operators merely guide the machines.

This modernization program took time and planning. Company engineers in cooperation with equipment manufacturers spent long hours planning layout and discussing the best equipment to install.

The installation consisted of: 1. Overhead equipment for receiving and transportation to and from temporary storage and inspection; 2. Powered on-the-floor vehicles for transportation to machining areas; 3. Casters equipment for intra- and inter-departmental movement of smaller loads.

Racks included: 1. "A" sections for long lengths of bar stock and tubing; 2. Shelf racks with small openings for narrower flat stock; 3. Adjustable upright racks with

larger openings for wider and larger flat material; 4. Square adjustable tiering type racks for coiled stock.

Racks for Bar Stock

A covered 56-ft.-long receiving station is located outside the north end of the building. Inside the plant, from north to south, is the bar stock storage area; several raw stock processing stations (small rolling mills and straighteners); raw stock inspection; large flat stock storage; temporary raw stock storage; and coil and miscellaneous storage.

A monorail system extends from the receiving area along the west wall of the building for a distance of approximately 300 ft. Four switches link the main track with spurs which serve the inspection and storage bays. A fifth bay, for stock awaiting inspection, is spanned by a single-beam crane.

Three 8000-lb. electric hoists, tractor-powered for travel, are incorporated in the monorail system. All hoists are equipped with spreader bars which are used in conjunction with wire rope slings arranged as cradles or chokers. The latter pattern is used only when stock is improperly bundled.

Incoming stock is delivered to a station inside the plant, where a seven-ft. section of track is connected to a floor scale. The load is weighed without being removed from the carrier.

The bar stock storage area is located at the north end of the plant adjacent to receiving. The stock is deposited on steel-frame platform trucks which have a capacity of 4500 lbs. These vehicles are spotted next to the rack, made of angle iron and tubing, in which the material will be stored. These "A" sections range from 12 to 14 ft. in height and from 40 to 48 ft. in length. Pins are inserted in the uprights on various centers according to the size and type of stock.

Wooden shelves built between the inclined vertical members are designed for material measuring more than 12 ft. in length. All



*At E. W. Bliss Company it's
FOUNDRY PATTERNS

...they're "ROUTINE" for ROSS Lift Trucks

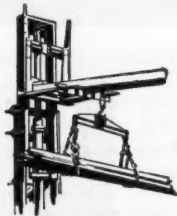
Handling this pattern for the bed of a 1,000-ton press would be a big job for ordinary equipment. Yet it's just "routine" with this ROSS Lift Truck which efficiently and safely transports patterns to and from storage at the E. W. Bliss Company's foundry in Toledo, Ohio.

If your plant is typical of most, handling jobs similar to this are a continual problem. That's where ROSS big-load handling efficiency can augment your present equipment, save man-hours and costly delays—very often enough to pay for itself in a year or less.

ROSS Lift Trucks are available in capacities from 5,000 to 18,000 pounds. All have gasoline power and are on pneumatic tires. Write today for complete details and performance data.

BOOM ATTACHMENT for ROSS Lift Trucks

Lift truck can be used as auxiliary crane. No interference with forks. Easily detached . . . Other attachments: scoop, ram, snowplow, winch, side-shifter, slope-piler, etc.



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IDEAS YOU CAN USE

Tested techniques for better production

300-TON CAPACITY TRAILER—Designed and built by the Eidal Manufacturing Company of Albuquerque, N. M., this mammoth 300-ton capacity trailer was fabricated with General Electric welding equipment. It is to be used by an oil company in moving rotary oil-drilling rigs and draw-works

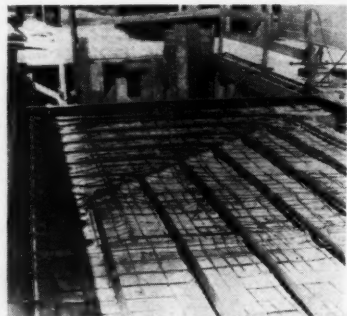
pitched downward toward the outside edge of the platform so that the coils can be drained. Thermometer wells are located at several points in one of the slabs to permit determining the uniformity of heat distribution.

The snow melting coils carry a light petroleum fuel oil having a fire point of 300 deg. F. The oil is heated by 90-lb. steam in a heat exchanger and pumped into the system at 60 gallons per minute. Oil leaving the heat exchanger at 140 deg. F. was found to be returning at 100 deg. F. in a test run of several hours.—*Courtesy, A. M. Byers Co.*



without disassembling. The original method of moving rigs required 30 days, it was said, but with this 72,000-lb. trailer the entire equipment can be moved in about 24 hours, at approximately one-sixth the cost.—*Courtesy, General Electric Co.*

LET IT SNOW—Snow and ice on freight platforms are important factors in the economy of handling incoming and outgoing shipments in winter. At the American Cyanamid Co.'s Wallingford, Conn. plant it was decided to use heat to maintain a dry and safe working surface. The heated area of the platform there is 246 ft. long and 13 ft. wide. Heat is applied uniformly by means of 3000 ft. of wrought iron pipe, largely 1" pipe, imbedded in concrete and running lengthwise on 18" centers. At the end are wrought iron coil headers with inverted plug valves which are used to equalize flow through parallel



pipe runs. These valves are adjusted through sleeves in the overhang of the platform. Countersunk plugs, flush with the top of the platform, will permit removal of the valve plug if it should ever need repair. Coils are supported on inverted 1 1/4" angles laid on 12" wide by 3" thick concrete slabs. These slabs are

30 PER CENT MORE STORAGE SPACE—One lift truck for handling paper rolls has produced a 58 percent production increase at the A. L. Garber Co., Ashland, Ohio. In March 1949, the company put the truck to work in its loading, unloading, and storing operations. By replacing a manual system, Garber succeeded in reducing handling costs, saving time, increasing the storage capacity of its facilities, and reducing damage to rolls. The truck, which has a paper clamp attachment, unloads boxcars and motor freight.

Formerly, most rolls were received on side. Those that came on end were tipped over on a rubber tire. Stacking heights were limited. To withdraw the



paper from stock was a difficult problem especially since it was often necessary to move a number of rolls to get the desired one.

Specific savings and advantages credited to the truck are as follows: 1. Savings of 58 percent in production time; 2. 30 percent more paper can be stored in the same area; 3. Storing on end eliminates cost of dunnage; 4. A reduction in damage which is estimated will amount to approximately \$1300 annually.—*Courtesy, Automatic Transportation Co.*

racks are numbered and lettered for easy stock selection and record keeping. More than 1000 different sizes of bar stock totaling approximately 3,000,000 lb. are stored in an area totaling less than 5000 sq ft.

When needed for processing, small quantities of material are placed on trailers which are hauled by a small industrial tractor to the screw machines. Minimum amounts of stock are moved at any one time because of limited floor area around the processing equipment.

Intermediate Storage

Flat stock proceeds via monorail to the temporary storage area which is approximately 300 ft. from the truck dock. This storage bay is 18' x 198' and is laid out at right angles to the main track. It is designed for incoming flat stock awaiting inspection, since this type of material arrives in too large quantities for immediate checking. If this were done prior to permanent storage, overhead equipment would be tied up for long periods which would seriously hamper operations.

A seven-ft. section of the monorail track can be unlocked and pushed on perpendicular tracks to a position just inside the storage bay. This allows the hoist to deposit the load within reach of the single-beam crane which serves the area. Because the bundled stock is stored on the floor in compact areas, no racks are needed. Another reason is that the material is moved in and out at frequent intervals.

Tubular and Shelf Type Racks

In the inspection department the flat stock is lowered onto 48" x 52" skids to which are attached vertical pipes 2 1/2' high. Horizontal pipes are welded to the vertical members and a wooden platform is laid on the structure to provide a convenient working height for inspectors. The loaded skid is transported by a hand lift truck.

After inspection and oiling, the material is placed in tubular or shelf type racks. A total of 100

storage racks are located throughout the department. Shelf type containers with 12-in.-wide openings hold more than 1000 sizes of small narrow flat stock. Upright racks of tubular construction are designed for wider and longer flat material and for coiled stock.

These latter racks are constructed with interlocking pins for tiering. Larger flat material and coiled stock are transported to fabrication within the racks by a 6000-lb. capacity high lift platform truck. Thus the racks perform the double duty of accommodating the material during storage and serving as a stand during machining operations.

Smaller flat stock is removed from the shelves and transported by platform trucks to processing. Minimum loads are moved at a time because of limited floor space at the machines.

Four Main Benefits

In the months since 1948 when the new equipment was installed, the Burroughs Adding Machine Co. has received, stored and processed more material in less time than in any other period in its history. Faster handling has meant less inventory with greater output. The revamped receiving practices, plus other innovations and improvements in manufacturing, have enabled the firm to meet unusually high post-war demands.

Specific benefits obtained from the program are as follows:

1. From 25 to 40 percent savings in manhours depending on the operation.
2. A 30 percent reduction in floor space.
3. A material reduction in accidents. (While injuries were never considered a major problem, a marked percentage decrease even of a small original number was considered important.)
4. Higher employee morale was noted because of improved working conditions. This point has always been considered vital by the company, which is noted for its excellent human relations.



BECAUSE THEY ARE QUIET and fume-free, battery industrial trucks can be used in virtually any part of the plant. They can even be provided with spark-enclosed construction if fire and explosion hazards exist.

They use low-cost electric power and use it with peak efficiency ... starting instantly, consuming no power during stops. Their electric motors have few wearing parts; are easy to maintain; rarely need repairs. Thus they have inherent economy and dependability.

They are doubly dependable and economical when powered by EDISON Nickel-Iron-Alkaline Storage Batteries. These are the longest-lived and most durable of all batteries, with steel cell construction, electrolyte which is a preservative of steel, and a foolproof principle of operation.

If you do not already use EDISON, get a current price quotation—you will probably find initial cost *much lower* than you think. Couple this factor with well-known EDISON long life and you will have the key to year-after-year economy.

ADVANTAGES OF EDISON NICKEL-IRON-ALKALINE BATTERIES:
They're mechanically durable; electrically foolproof; quickly and easily charged; simple to maintain; not injured by standing idle.



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STORAGE BATTERIES



EDISON STORAGE BATTERY DIVISION
of Thomas A. Edison, Incorporated, West Orange, N. J.
In Canada: International Equipment Co., Ltd., Montreal and Toronto

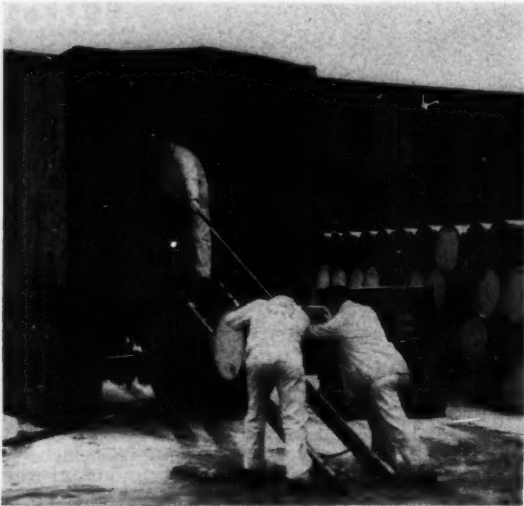
Pallet Program for Material

**RIDING TYPE AND MOTORIZED HAND
PALLET TRUCKS
HARDWOOD & PAPERBOARD PALLETS**

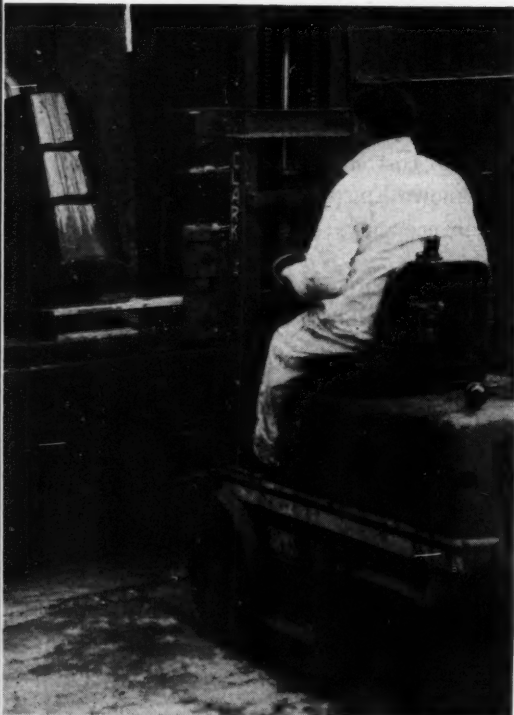
Part 1

By J. J. HUDSON

Supervisor, Industrial Engineering
Department
Sherwin-Williams Company, Chicago



IT WAS A STRUGGLE (top photo)
to load barrels the old way. Lower
photo shows better method.



HAND - GUIDED PALLET trucks
are proving their value, also in
connection with elevators.

MOST of the products handled in our warehouse operation are 50 lb. and 100 lb. bags of raw material and 50-gallon drums of finished goods. The operations include the receiving, warehousing and delivery of the raw materials and inter-plant delivery and shipment of drums.

Unload and Deliver Raw Materials

Prior to the installation of this palletization program, all raw materials were manually handled from car or truck to storage and again from storage to the point of usage in the various departments. This method required that the materials



Materials in Bags and Drums

The object of this report is to show how reductions in costs have been obtained through improved handling methods in the receiving and storing of raw materials. The installation of the program required an expenditure of \$26,463.00 which will be amortized in less than one year. An annual savings of \$32,000.00 has been made possible by this program. A prize-winning paper in the FLOW Cost Analysis Contest.

be handled a minimum of four times from the car into storage and from storage to the manufacturing departments. All operations were on an incentive basis, and the examples on the following page show the time standards established for unloading and delivering of raw materials.

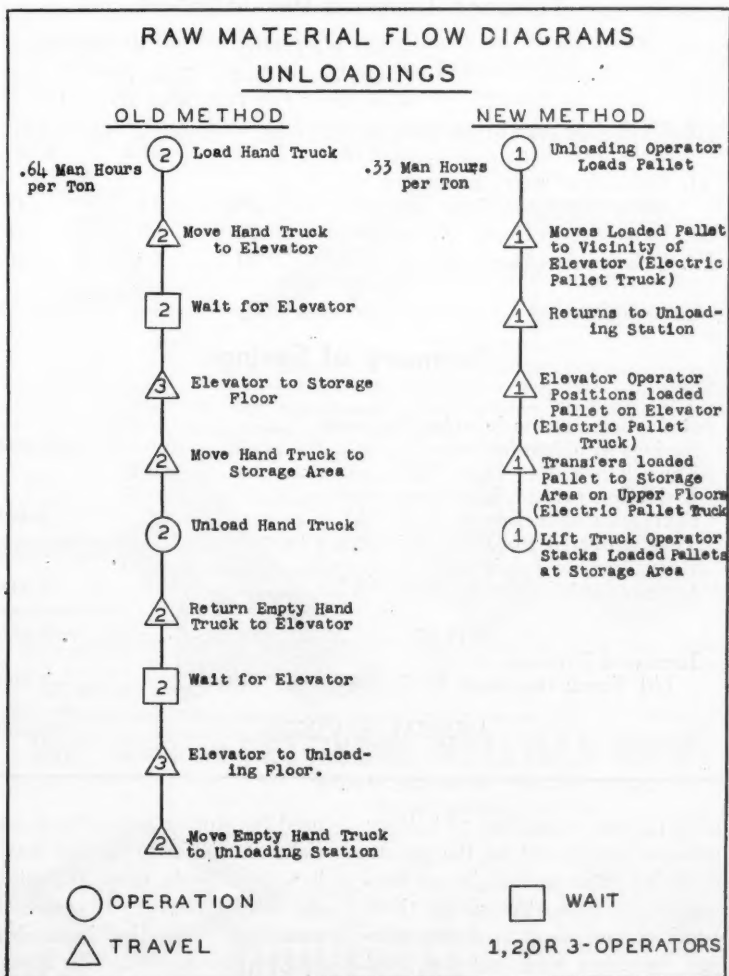
The materials were moved on two and four-wheel hand trucks and on semi-live skids, and the first problem was to provide means for converting to power handling of load units. Gasoline powered fork trucks were selected for the tiering operations since the elevator and floor capacities of the buildings were not sufficient to permit the use of heavier powered equipment. Battery powered hand pallet trucks were obtained for moving palletized loads in the raw materials warehouse and dock areas.

It will be noted that the time

required to unload materials to the upper floors, as shown in the table, on the next page, was considerably higher than for unloading to the first floor. This difference was due primarily to the delays in waiting for elevator service which in some

cases amounted to 25% of the allowed time for the operation.

Under the new program, delays at the elevator have been eliminated. The materials are loaded on pallets from car or truck and moved to an area near the elevator.



FLOW ENGINEERING avoided waits and lifting. Compare "old" and "new" methods in this chart.

The elevator operator using power equipment moves the pallet loads to the upper floors where they are later stacked by the lift truck operator. Deliveries of raw materials from storage to the point of use are made in pallet load lots and are moved by battery powered hand pallet trucks.

A graphic comparison of the old and new methods for the unloading of raw materials is shown in the material flow chart.

Fire insurance regulations pro-

hibit the use of gasoline or battery powered equipment in the manufacturing areas so that it was necessary to confine the use of these types of equipment to docks, storage locations and outside yard areas. Manually operated trucks were obtained for handling palletized loads of materials in hazardous areas. In making deliveries to the manufacturing departments, pallet loads of materials are taken from storage by battery powered hand pallet trucks and moved to a location near the point of use. The load unit is then delivered to the manufacturing area by a manually operated hand pallet truck.

A study was made to determine the type and size of pallets to be

let is also adaptable to the batch size loads required in the manufacturing departments. Since the installation of this program it has been learned that damage to bagged materials (when maneuvering pallets in and out of storage) will be minimized if the corners of the pallets are rounded.

While the palletization program has been in effect for only a few months and full utilization of the equipment has not yet been attained, standards have been established for the unloading and delivering of raw materials. The new standards are considerably less than the original standards which were based on manual handling of materials. The summary indicates the increase in tons handled per manhour and the reduction in costs that have taken place since the palletization program was initiated.

Approximately 95% of all materials delivered to Department "B" are handled by the "B" Department batch assemblers. These operators, using battery powered equipment, select materials from storage in batch load lots for delivery to the manufacturing areas. The materials for B-1 are delivered direct to the mixers by the power trucks since this area is not considered hazardous. Materials selected for delivery to Department B-2 are moved into the north end of Building #18 by battery powered trucks, then to the mixers by hand pallet trucks.

Consideration is being given to the possibility of extending this procedure for handling raw materials to other departments where the nature of the operation is such that the operators have idle time during the manufacturing processes.

The cost of installing the improved methods on the unloading and delivery operations amounted to \$23,363.00. Approximately 31,121 tons of dry raw materials were used in the "A" and "B" Departments during the past year. The reductions in handling costs, obtained through the palletization program and applied to this ton-

Time Standards For Raw Materials

	<i>Tons Per Man Hour</i>
Unload 50# bags from car to 1st floor.....	2.75
Unload 50# bags from car to upper floors.....	1.57
Deliveries from storage to Department A.....	1.07
Deliveries from storage to Department B.....	1.75

Tonnage Increase Per Manhour

	<i>OLD METHOD</i>		<i>NEW METHOD</i>	
	<i>Tons Per Man Hr.</i>	<i>Cost Per Ton</i>	<i>Tons Per Man Hr.</i>	<i>Cost Per Ton</i>
I. Unloading cars to 1st floor areas 50# bags	2.75	\$.51	3.85	\$.37
II. Unloading cars to upper floor storage area 50# bags	1.57	.90	3.0	.47
III. Deliveries to Dept. "A"	1.07	1.32	1.9	.75
IV. Deliveries to Dept. "B"	1.75	.81	4.7	.30

Summary of Savings

Tons unloaded	31,121	
Reduction per ton in unloading costs.....	\$.35	
Savings in unloading costs		\$10,892.00
Tons delivered to Dept. "A"	16,543	
Reduction per ton in delivery costs.....	\$.57	
Savings in deliveries to Dept. "A"		9,429.00
Tons delivered to Dept. "B" (95% x 14578)	13,859	
Reduction per ton in delivery costs.....	\$.81	
Savings in deliveries to Dept. "B"		11,218.00
TOTAL	31,539.00	
Increased Expense		
Lift Truck Operator, Utility Man and Miscel.....	7,000.00	
ANNUAL SAVINGS	\$24,539.00	

hibit the use of gasoline or battery powered equipment in the manufacturing areas so that it was necessary to confine the use of these types of equipment to docks, storage locations and outside yard

used for storing bags of raw materials. A 40" x 48" pallet was selected as being most suitable for the largest number of various size containers, including bags, drums and empty cartons. This size pal-

nage, will result in an annual savings of \$23,546.00, as shown by the summary on the facing page.

The limitations on load sizes which have been necessary because of the small elevator size and capacities have been overcome to some extent. For example, the elevator in Building #13 has a capacity of only 3000 lb. and the car is too small to accommodate a battery powered hand pallet truck plus a load. In order to overcome these limitations, the elevator operator places the pallet load on the elevator near the edge of the car so that only the forks of the hand pallet truck are on the elevator. The battery powered hand pallet truck is then removed and set aside on the first floor. The load is transferred to the upper floor where the elevator operator, using a second power hand pallet truck, removes the loaded pallet in a similar manner. The load must be taken off from the same side from which it was loaded and only the forks of

the transporter are placed on the elevator to prevent overloading.

Actual tests have proven that by this method a 1500 lb. power hand pallet truck can safely place or remove a 2200 lb. load on a low capacity elevator since only 2450 lb. of the total load is transferred to the elevator, the remainder of the gross weight is transferred to the floor off the elevator. In the event that pallets must be removed from the elevator opposite the side at which they were loaded, and the loads cannot be reached by the forks of the powered hand pallet truck, a section of roller conveyor has been installed to permit the load to be rolled across the car and out of the elevator.

There has been some question as to the amount of storage capacity gained or lost through the installation of a palletization program. It is obvious that a considerable amount of space can be gained on first-floor areas having high ceilings and heavy floor capacities. It

has been proven that, under normal conditions, there is no loss of storage space on upper floors since the floor load capacities can be reached in most cases where sufficient ceiling height is available.

The installation of this palletization program has made it possible to obtain increased storage capacity through a more effective use of available floor space. For example, when materials were manually handled, there was always a reluctance to move stocks to make room for incoming shipments, and as a result there were usually large voids in the storage areas. The use of mechanical handling equipment makes it possible to very quickly move stocks for making room for inbound shipments, which in turn results in better utilization of floor capacities.

Several check studies made to determine the pounds per sq. ft. that were being loaded in Buildings 12-A and 13 by hand stacking prior to the installation of the pal-

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CAR UNLOADERS for unloading hopper bottom cars. Models 483-484. Belt or Drag.



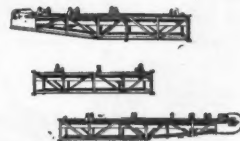
FLAT or TROUGH BELT CONVEYORS for handling coal, coke, sand, gravel, etc. to trucks or piles. Models 481 & 482.



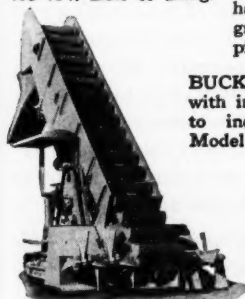
DRAG CONVEYORS for handling all sizes of coal and coke. Model 486.



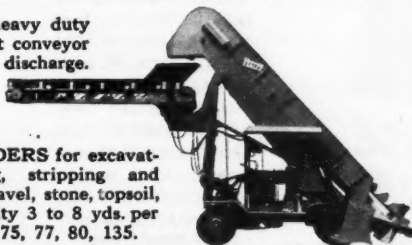
PACKAGE CONVEYORS for handling bags, boxes, crates, cartons, hampers, etc. Model 485.



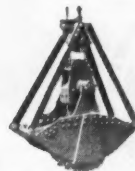
SECTIONAL CONVEYORS made in easily assembled individual sections. Portable or stationary for handling all bulk materials. Model 487.



BUCKET LOADERS, heavy duty with integral swivel belt conveyor to increase zone of discharge. Model SBC.



BUCKET LOADERS for excavating, rehandling, stripping and loading sand, gravel, stone, topsoil, coal, etc. Capacity 3 to 8 yds. per minute. Models 75, 77, 80, 135.



Heavy Duty or Light Duty Clamshell Buckets for high speed excavating or rehandling.

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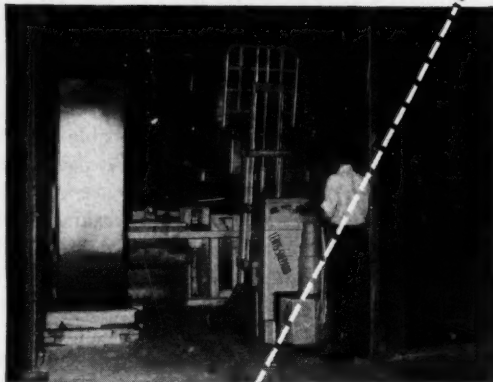
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letization program, revealed that less than 100 lb. per sq. ft. was being stored in these areas. This figure included aisles and vacant areas. Similar checks made after the palletization of the materials have shown that we are now storing 135 pounds per sq. ft. in the same areas, an increase of 35 percent, or approximately 11 carloads of material.

Operator Training and Maintenance

We had some difficulty in training the operators to handle powered equipment, which resulted in some inefficiencies and damage to materials. However, a program is underway which should make it possible for us to select and train the right type men for the job.

The manufacturers of the material handling equipment have been contacted and arrangements made to have one of their instructors visit our plant and assist us in establishing the training program.

The maintenance and service of the equipment is of major importance and a program has been established whereby the operators are required to inspect the machines daily. The equipment is serviced by a qualified mechanic at least once each week and a card system has been installed to make certain that this program is carried out.

A permanent record is being kept of the cost of maintaining and servicing each piece of equipment. While the program has been in effect for only a few months, we believe that satisfactory progress is being made and that further reductions in cost can be made as new methods are applied.

(The concluding part of this paper will appear next month—Ed.)

Better, Bigger Directory

New, improved features have been incorporated in the 1949-50 FLOW Directory. More definitions and sketches; revisions for easier and more complete reference. Copies are \$5.00 each. Send your order to the FLOW Directory, 1240 Ontario St., Cleveland 13, Ohio.

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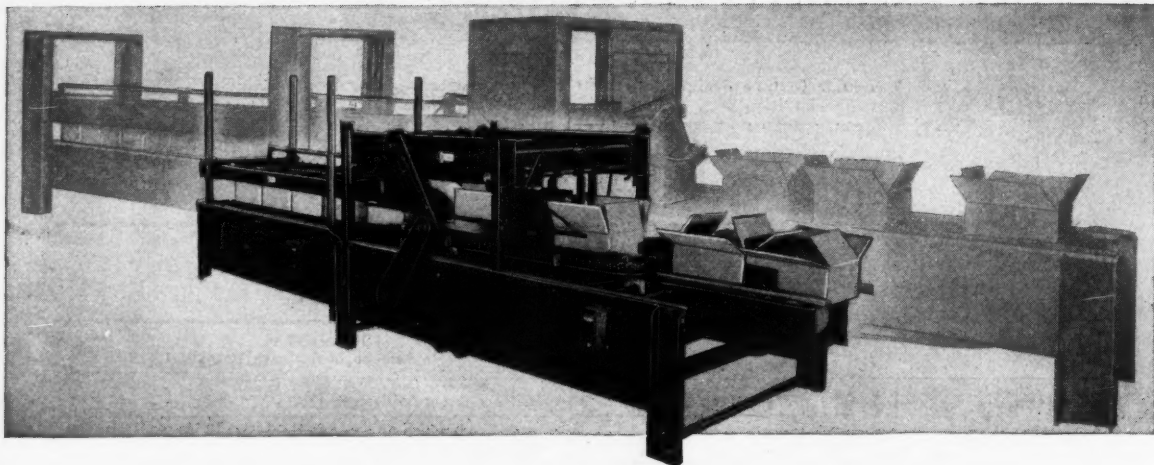
A regular feature designed to help the engineer and others responsible for material handling. The FLOW Engineering Data Page will cover a different category of equipment each month.

(From the 1949-50 FLOW Directory of Material Handling Equipment, Machinery and Accessories)

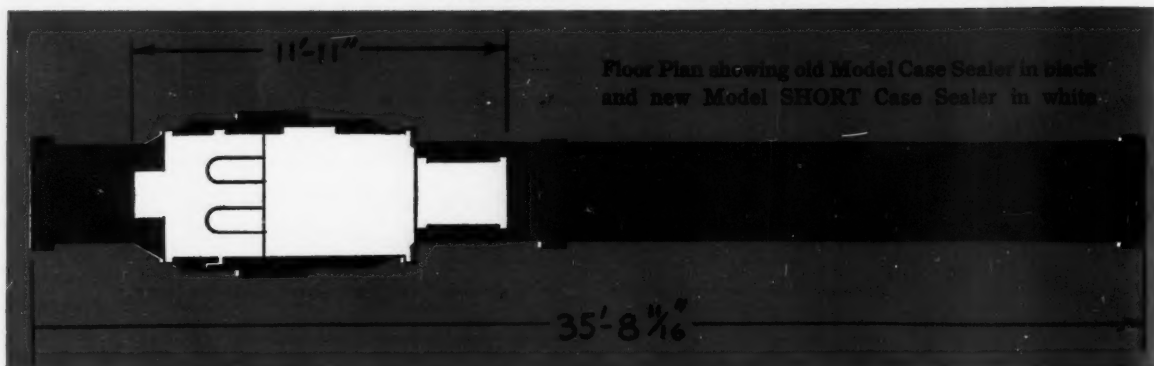
WIRE ROPE

CAUSES OF DAMAGE IN SERVICE AND MEASURES FOR THEIR CORRECTION

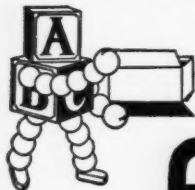
DAMAGE	PROBABLE CAUSES	CORRECTIONS (In Addition to Replacing Rope)
EXTERNAL WEAR	Sheaves wrong size	Replace with correct size new sheaves.
	Sheaves worn	Replace with new sheaves.
	Insufficient Lubrication	Clean and relubricate. Provide regular lubrication.
	Dragging or rubbing on obstructions	Remove obstructions or deflect rope with sheaves or rollers.
	Sheave bearing frozen	Replace bearing or sheave and bearing.
	Sheave weight excessive	Replace with lighter weight sheave.
	Fleet angle excessive	Move sheave farther from drum or replace with a fleeting sheave.
	Sheave guard rubbing	Repair or replace guard.
INTERNAL WEAR	Sheaves mis-aligned	Align sheaves.
	Abrasive penetrating strands	Clean and lubricate regularly.
	Sheave diameter too small	Replace with correct diameter sheaves.
	Reverse bending	Change reeving to eliminate reverse bending.
SNAGGING OR CUTTING	Sheave flange broken	Replace defective sheave.
	Drum groove damaged	Repair or replace drum.
	Overwinding on drum	Use longer drum, less rope, or install drum follower.
STRANDS BROKEN	Excessive wear	See causes of wear, above.
	Overloads, shock loads	Use larger rope, smaller loads, gradual application of load.
	Reverse bending	Change reeving to eliminate reverse bending.
	Fatigue at connections	Cut back ends and replace fittings.
	Rope coming off sheaves	Use sheave guards, correct the alignment of sheaves, reduce fleet angle.
DEFORMATION	Sheave or Drum diam. too small	Replace with correct diameters.
	Rope coming off sheaves	Use sheave guards, correct the alignment of sheaves, reduce fleet angle.
	Kinks	Unwind rope from spool and reeve without twisting or looping
CORROSION	Insufficient lubrication	Provide regular lubrication.
	Acid or moist conditions	Shield rope and lubricate often.
HEMP CENTER DESTROYED	Acid or caustic fumes or fluids	Shield rope from fumes and fluids. Clean and lubricate often.
	Excessive heat	Shield from heat or replace with metallic center rope.



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PACKAGING MECHANICS SECTION

A regular monthly section in which are presented solutions to the problems of efficient filling and handling the boxes, cartons, bags, bottles, cases, etc., used in commerce and industry.

C O N T E N T S

BRIEFS OF S.I.P.M.H.E. TALKS—at the recent Fourth Annual Industrial Packaging and Material Handling Exposition, Detroit. Useful information for readers who could not attend the show. Various subjects of unusual interest are presented..... 40

TESTED FOR PERFECTION—damage had to be prevented to a large product with a vulnerable surface. The company conducted exhaustive pre-shipping tests on all components of the container. Other shippers may get more than one good idea on interior packing..... 44



W. L. Noumann



E. B. Candell



L. E. Evans

Briefs of Five S.I.P.M.H.E. Papers Presented At The Fourth Annual Industrial Packaging and Material Handling Exposition

These adaptations of five papers given at the Fourth Annual Industrial Packaging and Material Handling Exposition are published here for the benefit of the thousands interested in material handling who could not attend the S.I.P.M.H.E. Institute and the concurrent Exposition. Lack of space permits only partial reproduction of a few of the many good papers that were delivered.

Packaging Machinery An Essential To Mass Production

By L. E. EVANS

Package Machinery Co., Chicago, Ill.

"Most people fear machinery which is unfamiliar to them."

MANY companies avoid the purchase of packaging machinery for their operations as long as they can afford it. If they have need for more packages, they hire more people. Why is this? We often find that if the production volume warrants the capital investment and equipment is not purchased, it is because of fear. Most people fear machinery which is unfamiliar to them. Packaging machinery looks complicated to the average individual. Usually this is not true. For the most part packaging machinery is a combination of recognized mechanical movements engineered to produce the desired result.

We usually consider that there are three general classifications of packaging machinery. The first of these is the package maker. This may be a cellophane bag making machine, a box

forming machine, or any other unit to make the original package.

The second division is the filler. These vary from semi-automatic to high-speed completely automatic units. Care must be taken in selecting the proper type of filler for your product. Many products cannot be filled automatically.

The highlights of talks given here in excerpted form were delivered in the Packaging and Materials Handling Institute conducted by the Society of Industrial Packaging and Materials Handling Engineers under auspices of the School of Business Administration, Wayne University, Detroit, October 3 - 7, 1949. This Institute was the educational program of the Fourth Annual Industrial Packaging and Materials Handling Exposition held at Detroit in Convention Hall, October 4 - 6, 1949.

The third piece of equipment is the closer. Perhaps it is a heat sealing unit for the cellophane bags or a gluing unit for closing the top of a cereal package. It might be a wrapping machine which covers a tray of product left visible for display purposes.

There are often many deviations from the general classification mentioned. For example: a potato chip manufacturer will most likely buy the bags already printed from a convertor. He will only fill and close the packages. The pharmaceutical house will require extensive coding and labeling. It may also require a variety of sizes, and relatively low volume of each. Here, requirements must be calculated carefully. The over-all daily volume may be tremendous and yet it may be impractical to use filling or closing equipment.

When attempting to set up an automatic or semi-automatic packaging program, it is a good idea to gather information from several sources. Too often machinery is purchased on the recommendation of one individual. After delivery it is found that this was not the practical machine for the application.

Over a period of years we have arrived at a more or less universal formula for determining whether or not a packaging machine investment is warranted. This formula is based on savings made possible by the use of the machine anticipated. It may not always hold true, but it has worked out so well that I would like to pass it on to you. If the cost of a piece of equipment can be amortized in five years or less, it is warranted. If it can be amortized in three years or less, it is demanded. Now, some companies consider two years instead of three years as the time element on a demanding purchase. The reason is usually due to the short life expectancy of the product they manufacture.

Today more than ever before, competition and high labor costs are forcing manufacturers to invest in packaging machinery. In addition, new protective packaging materials are being introduced which promise longer shelf life for the product. The manufacturer, jobber, retailer and the consumers are assured that the product will remain fresh. More and more products are being packaged. Few of us today buy bulk tomatoes. We pay a premium price to buy a packaged item. Tomatoes have started the trend. Fresh produce of other types are appearing in packages in stores all over the country.

A certain Chicago cracker manufacturer introduced a new and obviously more expensive package to the field. Most of the competitors sat back and said, "It cannot work out." But it did. The new package gave the housewife a certain buying advantage. She had to pay two or three cents more per package, but it was worth it. That manufacturer's sales went up and stayed up.

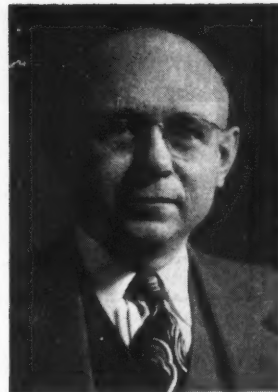


C. J. Zusi

Competitors' sales dropped off until they, too, changed their packages.

The call is for more and more packaging machinery. You would expect that this trend would be good for the packaging machinery business. It is, but it brings with it headaches that are hard to bear. Whenever a new type of package is accepted by the consumer, the entire industry begins to swing in that direction. Everyone wants equipment at the same time. Also, normal deliveries are no good; immediate deliveries are demanded.

Every aggressive packaging machinery manufacturer is constantly developing new types of machinery to handle your production problem better. By better we mean the equipment must lower costs, and oftentimes material costs, or provide a better package that can be sold at a premium because of its advantages. Naturally this results in additional profits for you.



R. F. Weber

In those days we did not have packaging or materials handling engineers. Most of us had a hand in packing and moving materials, from the superintendent to the sweeper. Yes, there were truck-chasers, trying to outwit one another to maintain an adequate supply of trucks for their respective sections, in some cases carelessly dumping precision parts. You can visualize how this affected the employees' attitude toward doing a quality job, and the additional cost of doing business in that manner.

There was gradual improvement in the Harvester Company, along with other industries, in packaging and handling methods over the years prior to World War II. The heavy platform gas lift trucks came into the picture during that period, mostly for forge and sheet metal shops. They were used for intra-departmental movement of loose parts in tote pans or in connection with 12-inch-high skids or skid boxes and very seldom had stacking features.

Gravity roller conveyors for packaging, chutes for loading and storage, and rearrangement of packing departments to facilitate operations indicated the trend.

All of these factors did much to ease the operations for the men and give better protection to the product.

When the war broke out in 1941, we all "dug in" and helped develop a handling and packaging system which compared favorably with the tremendous advance in other fields of war activities.

How can we be assured that we are recognizing the benefits so apparent in materials handling and packaging engineering? Research and training have been very effective in bringing about much of the progress made in Harvester operations. This phase of our activities is considered a very essential one. The Product Protection and Materials Handling Research Section of Harvester's Manufacturing Research laboratory, located in Chicago, cooperates with all of our manufacturing plants to develop new and improved practices. Periodically, one-week training courses are conducted for Works'

How Labor and Management Both Benefit From Engineered Packaging and Materials Handling

By R. F. WEBER

General Supervisor
Materials Handling Research
International Harvester Co.

"So many operations were done the hard way."

MY experience with handling and packaging goes back about 25 years, starting at the Harvester plant in Milwaukee. Most of the materials movement (and I believe this same pattern prevailed generally at that time) was by heavy 4-wheel trucks, pushed manually around the plant, in and out of buildings, in all sorts of weather. Occasionally, a large tractor would pull a train of trucks between buildings. The disadvantages for both labor and management were manyfold: more accidents, greater fatigue and extra absenteeism for the men, higher costs, inadequate storage, production delays and greater damage to product for management.

So many operations were done the

hard way. I recall a large engine crankshaft which was manhandled and trucked through at least eight production departments, and up and down elevators. Finally it was dipped into a hot "grease" tank, leaving a heavy black mass with which it was dropped into a large wooden box, equaling approximately the weight of the shaft. Here again you had a muscle job with resulting backache and fatigue and low morale, which meant much scrap, a product below par, and inadequate protection. We found that a tired worker was not an efficient worker. These old-fashioned handling methods—with constant hoisting, hauling and pushing—made employees feel fatigued long before the day was over.

PACKAGING MECHANICS SECTION

Packaging and Materials Handling Engineers. For this course, two manuals have been developed, in addition to visual aids and classroom procedure. The benefits to both labor and management, as a result of this research and training work, are fully recognized.

Out of World War II came an awakening in industry which made for rapid advances in our thinking and action in both packaging and materials handling engineering. As a result, labor and management have mutually benefited . . . Just as "for lack of a nail a war was lost", engineered packaging and material handling are the nail upon which both labor and management are depending upon to help win the battle of production and costs.

New Developments in Packaging Materials and Methods

By **CHARLES J. ZUSI**

Vice President

Container Laboratories, Inc., Chicago, Ill.

"There is a revolution going on before our eyes."

CHANGES are occurring in greater number and more rapidly now than at any previous time in the entire history of the packaging industry. There are various reasons for this, which largely stem from work which was done toward the development of things required during the war.

This accelerated development of new things has stimulated technical activity. All of this technical activity means that the material field is being more thoroughly explored, that the properties of all available materials and of new materials are becoming better known and, consequently, can be used more intelligently in the construction of containers, in handling devices and all of the other equipment required for packaging and shipping.

More testing is being done and better testing. New machines have been developed and the old machines have been revised and improved. New techniques have been invented.

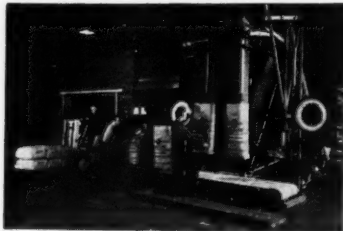
This activity has also resulted in new production techniques. For example, the devices which have been developed for producing cleaner pulp and boards are tending to eliminate the "sand holes" in jute boards, thus making possible better, stronger boards with less material. An important factor in this has been better grading of waste, new standards for which were adopted fairly recently. With the semi-chemical processes of preparing pulp, new materials, notably hardwoods, are being used to a much greater extent than heretofore, producing new and improved forms of corrugating materials for fibreboard boxes. A growing appreciation of the influence of flat crush resistance on the strength of boxes has resulted not only in materials but also methods which will produce stiffer corrugations.

One significant development is the use of sulphur to stiffen the corrugating medium in corrugated boxes. This is a process of impregnation of the corrugating medium with molten or plasticised sulphur which is applied to one or both sides of the board, gen-

erally by immersion of the paper in a bath of molten sulphur. It is claimed that this treatment will give the combined board considerably better flat crush resistance, especially at high humidities.

The V-board weatherproof boxes developed during the war still are being manufactured to satisfy the reduced requirements of the armed forces and also for export and domestic civilian uses. They are being made in the grades formerly required and in some new grades, one example being the

AUTOMATIC PACKAGING OF ROCK WOOL—Packaging light fluffy rock wool has always been burdensome for two reasons. 1. It creates dust which magnifies the occupational hazard. 2. It is difficult to control uniformity of weight. A recently designed rock wool packaging machine is said to overcome both of these objections. The automatic equipment is of twin construction to permit continuous operation. A bag is placed over the duckbill which expands



and holds the bag firmly in position. An airtight seal is thus formed, preventing the escape of dust while the bag is being filled. The motion of the duckbill is controlled by air pressure which is regulated by a foot valve. Before the multiwall bag is released, a pneumatic ram forces the rock wool into the bag in pre-weighted quantities to a predetermined height. The material is compacted lightly as it is introduced into the bag. The filled container is then lowered onto a traveling conveyor that carries it through a sewing head.—
Courtesy, Union Bag & Paper Corp.

VUS boxes which are between the V2S and the V3S grades in their properties. With the use of these boxes, the accessory suppliers have been stimulated into producing more weatherproof tapes, glues and so on, all improvements which are helpful to you as packaging engineers.

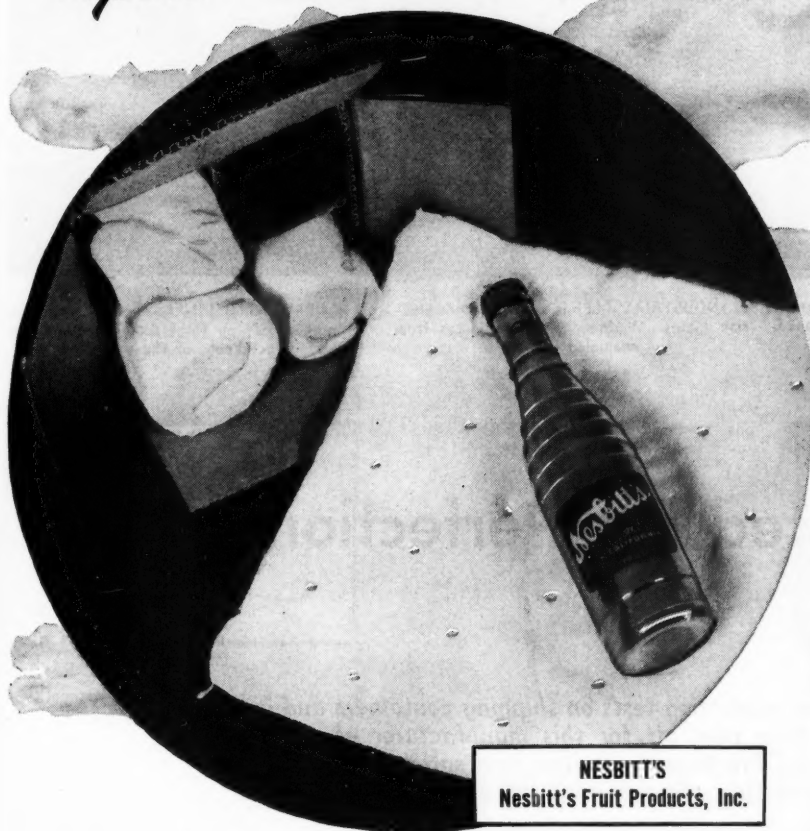
Aside from the new packages described in the Consolidated Freight Classification, there have been quite a few new, clever and useful designs in fibreboard boxes. There is a box which opens, ready to be filled, without the necessity for making any bottom closure, a feat accomplished by scoring a one-piece blank with diagonal creases and stitching it in the middle of both ends of the box. Another type of package is one which is insulated with light multi-wall corrugating material and fitted inside with a plioilm bag so that it can carry products like fresh sea foods, including live lobsters, with very little change in the temperature at which the articles were packed during shipments, which generally is by air. A special feature of solid fibreboard cheese boxes is a clever lock bottom. Heavy, loose items are being shipped in a corrugated box which is reinforced outside with telescoping halves to which flanged top and bottom trays are stitched. There are many other ingenious designs.

There are certain new materials which are being used to a much greater extent in packaging than heretofore. Aluminum was mentioned for pallets but that is only one of the many forms in which it has appeared. All of us are familiar with it as foil and with its use in collapsible tubes, but more recently it has been formed into packages for cigarettes, for frozen foods, and for other items, while in heavier, stiffer shapes it is being tried in crates.

The use of plastics has expanded rapidly. They appear in all kinds of forms: films, closures, bags, rigid containers, coatings. A rather spectacular application which has been reported in the trade press recently is that of the "disappearing package". Carbon black always has been a very difficult material to handle since it is likely to spread a thin layer of fine black dust over everything in the vicinity when the package is opened. The logical answer to this difficulty would be a package which could be used without opening. Such a package, which at first glance appears to be an impossibility, was accomplished with the use of S-polymer film formed into a bag which is enclosed in an outer kraft bag. The carbon black is packaged in an amount equivalent to that required for one batch. At the mixing machine, the kraft bag is removed and the carbon black, together with its S-polymer bag container, is thrown into the mixer without opening, whereupon the bag disintegrates and in no way affects the qualities of the rubber which is being manufactured. It is significant too that the use of S-polymer, poly-ethylene and

(Turn to page 48)

Kimpak* Float Packaging



NESBITT'S
Nesbitt's Fruit Products, Inc.



Blocking and Bracing. Fruit-of-the-Month Club* Preserve Package. Photo courtesy of Harry and David, Inc., Bear Creek Orchards, Medford, Oregon

Cuts shipping costs— reduces damage in transit!

Does the product you ship enjoy maximum protection against weather and rough handling? Is your packaging operation fast, economical—up-to-date? Before answering, consider these facts about KIMPAK* creped wadding.

Unlike bulk packaging materials, the compact blanket form of KIMPAK is soft and clean. As quick and easy to apply as wrapping paper. Will absorb up to 16 times its own weight in moisture, within 30 seconds. KIMPAK is feather-light to reduce shipping weight; flexible—to conform to irregular surfaces; shock-absorbent—to guard against roughest handling.

Moreover, KIMPAK is neat and attractive-looking to add, rather than detract, from the appearance of your package. And there is a specification to meet every requirement of the Four Basic Methods of Interior Packaging: Bracing and Blocking, Flotation Packaging, Surface Protection, Absorbent Packaging.

Plan now to improve your packaging operation, and save money, too. For information, refer to your classified telephone directory under "Packing Materials" or "Packing Materials—Shipping"; or write directly to Kimberly-Clark Corporation, Neenah, Wisconsin.



Blocking and Bracing. French Type Cheese Assortment. Photo courtesy of Beble Bros. Co., Rolling Prairie, Wis.

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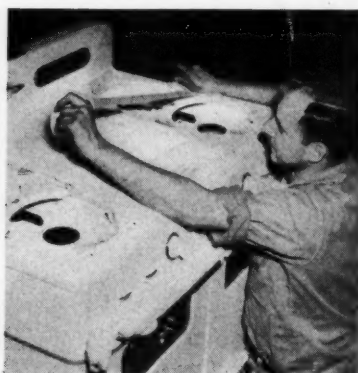
CREPED WADDING

*T. M. REG. U. S. PAT. OFF.

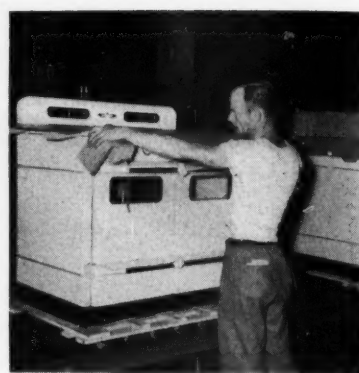
FLOW • DECEMBER, 1949



1. STEEL STRAPPING covered with kraft paper is placed around doors. Note creped wadding at several points.



2. INDUSTRIAL TAPE is used to secure area-plates. Wadding separates plates from enameled surface.



3. CORRUGATED LINER is placed over top of range. Pads on front scored section protect knobs of the range.

Tested For Perfection

Exhaustive pre-production tests on shipping containers and internal packing have paid off for this manufacturer of enameled kitchen ranges. Pre-testing resulted in a satisfactory container that met exacting requirements for a vulnerable product.

MANY companies realize the importance of conducting exhaustive tests on shipping containers which will hold future models. These tests assure that the final container will be satisfactory by the time the first model rolls from the production line, and also that no time need be wasted in refining or redesigning the container after production has started.

The Perfection Stove Co., Cleveland, the world's largest manufacturer of oil burning, cooking and heating appliances, recently entered the gas range field. As soon as final tests were made on these new ranges and pilot models were constructed, we set about to design and test a suitable shipping container and interior packing which would protect the product during

INDUSTRIAL TAPE, STEEL STRAPPING, CREPED WADDING, FIBREBOARD LINERS, WOODEN CRATE, ROLLER CONVEYOR, FORK TRUCK.

shipment to all parts of the country.

Six Requirements Set

The container had to meet six major requirements. 1. Prevent chipping of the enameled surface and eliminate friction between moving parts. 2. Prevent glass in the doors from cracking or break-

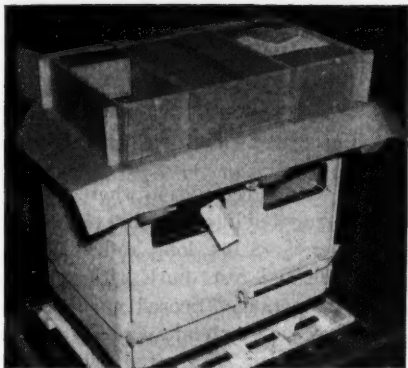
ing. 3. Prevent control knobs on the front of the stove from coming loose or falling off. 4. Necessary loose parts had to be secured during shipment. 5. Precision parts with small tolerances, such as burners, racks, grills, grates, etc., had to be protected and contained in the shipping crate without adding to its total size. 6. The cost factor had to maintain a reasonable "percent of package to product."

The gas range weighs about 300 lb. when completed, 359 lb. when crated. This meant that shipping containers had to be able to withstand considerable punishment should the unit fall or be dropped during transit.

Accordingly, we subjected loaded crates to all types of tests long before they were ever put in use. A 24-ft.-long inclined ramp with a

By J. A. PODOJIL

Chairman of the Packaging Committee
and Cost Engineer
Perfection Stove Co.
Cleveland, Ohio



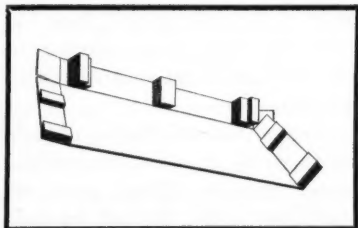
4. "EGG CRATE" is added. Accessories are placed in compartments forming solid top for cleated container.



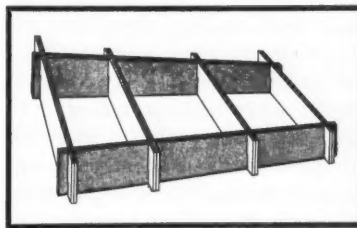
5. THREE OPERATORS lower top in several seconds. Note corrugated pad, inside back crate panel, right of photo.



6. FORK TRUCK removes packaged range from conveyor for transfer to storage or rail car. Crate base supports load.



8. DRAWINGS OF corrugated liner, left, and "egg crate", right, show details of construction features.



7. "CRASH TEST", shown with different container, is identical to test made on range crates before start of production.

bumper post was used for most of the experiments. The loaded crate was placed on a dolly (its sides extended from two to three inches over the framework of the dolly), backed up the incline and crashed into the post. Tests of this type were made on all sides and both ends of the container. A crate containing 350 lb. was released five ft. from the post; those with lighter loads were pulled farther up the incline.

The crates were also taken to major railroad and other shipping companies for their opinion. Finally, test shipments were made to all parts of the country via many types of carriers and the loads and containers checked on arrival.

Paper-Covered Steel Strapping, Industrial Tape

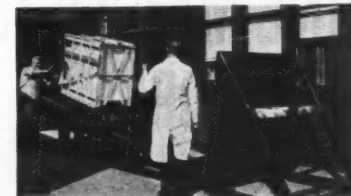
While these tests were designed primarily to examine the crate itself, attention was given to the protection afforded by the internal packing. Numerous experiments

were conducted. Through the use of protective padding, paper-covered steel strapping, industrial tape and corrugated spacers and padding, our new gas range literally "floats" within the container. Damage during transit is negligible.

Assembly on Skid Bases

As usual, crating begins before the final assembly operations. The ranges are laid on their sides on $30\frac{1}{2}'' \times 44\frac{1}{2}''$ wooden skid bases which are spotted on a $24'' \times 303'$ combination of powered slat and gravity roller conveyors. The powered sections travel an average of 17 ins. per minute. The conveyor line has a capacity of 60 ranges—it takes between three and three and one-half hours for a unit to complete its travel.

The ranges start their trip on their sides to permit easier placing of certain components. After traveling about 60 ft., identical skid bases are screwed to the bottoms of the stoves, which are then flipped



to an upright position. The bases consist of three longitudinal and five lateral members. The ranges are attached by four bolts, one at each corner. To allow for "give" between the load and the base, a $\frac{3}{8}''$ -deep rubber grommet is placed between the two at each corner. These grommets, resembling thick rubber washers, absorb much of the shock when the loaded cases are dropped or fall on their bottoms.

From the slat conveyor, the ranges are carried by gravity rollers, which are spaced on six-in. centers. Here electrical parts are added, and various inspections made. All conveyors are located 19 ins. from the floor to provide convenient working height. Steel slabs are

PACKAGING MECHANICS SECTION

inserted at regular intervals so that operators have secure footing when working on top of the ranges. Several 12-in.-wide openings are located in the system to permit cross traffic by operators.

Creped Wadding for Cushioning

The ranges move along the conveyor to the packing stations. First, 12 pieces of 1/4"-thick creped wadding are placed at various points. One 6"×20" piece is inserted between the oven door and the stove body and another piece between the broiler door and the range. Two additional 6"×24" sections are placed between the storage drawer and the range and the servicing compartment and the range—one between each. Finally, eight 4"×7" pieces are added between the drip pans and the top of the range. Four pieces are used for each plate.

This protective padding safeguards the range in two ways. 1. It separates those parts which, if they were not cushioned, would scratch each other. 2. It provides a soft base against which the parts rest when they are strapped in place. By raising these components from their normal position, they receive a more positive pressure from the strapping and industrial tape that is applied.

Industrial tape is used inside the oven and to secure drip pans. One piece of 1"×4" tape is placed across the broiler deflector handle to secure it to the compartment channel (this handle is used to convert the oven from broiling to baking). Lengths of 2"×36" tape are affixed to hold the drip pans to the top of the stove.

Two lengths of 3/8"×136" kraft paper-covered steel strapping are placed around each stove as a means of securing both sets of doors and the padding. One of the exhibits shows the arrangement of the steel strapping and the pad-

ding. The strapping is tightened with a regular tensioning tool covered at the bottom to prevent it from scratching the enamel.

Corrugated Fibreboard Pads, Spacers

Next is the station where the top corrugated liner is laid in place. The liner is 43 ins. long and 26 1/2 ins. wide and rests flush with the top of the range. Scored members on three sides extend an additional six ins. Two corrugated fibreboard pads are glued to each of the two lateral scored members. Their dimensions are 3 1/4"×5 1/2"×1 3/4". When the scored sides are folded down against the sides of the stove, these pads take up the slack between the two. They also act to keep the unit from shifting within the crate.

Three additional fibreboard pads are located on the longitudinal scored member. These pads are 3 1/2"×5 1/2"×3". Two of the pads are notched to fit around the two large control knobs on the front of

ONE MAN LIFTS HEAVY STEEL DRUMS

Easily
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Safely

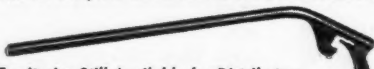


Universal Drum Upending Bar works on lever principle... requires only 135 lbs. to raise a 450 lb. drum. An average man now does the work of the strongest man.

The Bar is made of 1" solid steel... cannot bend or break regardless of drum weight. It hooks firmly under and over the lip of the drum... the greater the load the tighter it grips.

Drum can't revolve during upending, nor "break away" to cause damage and injuries. The 33" long Bar keeps the man safely away from drum during upending.

Write for complete details. \$7.50 each, f. o. b. Los Angeles.



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PACKAGING MECHANICS SECTION

the range, while the third or center pad acts in the same capacity as do the pads on the side scored members. A detailed sketch of the corrugated liner and the pads is found on these pages.

Next, the top compartment or "egg crate", so called because of its resemblance to small spacers in such crates, is placed on top of the liner. This fibreboard spacer acts as a support for the top of the outer container and is also designed to hold the range accessories which are packed individually.

The overall dimensions of the spacer is $30'' \times 43'' \times 7''$. The two middle lateral members are shorter, measuring $26''$ in length. The two outside lateral members extend one in. above the splashier back at the rear of the stove. The spacer is divided into three compartments into which are placed such accessories as oven racks, rack guides,

broiler grill, broiler bottom, etc. The various members, which are slotted and interlocked with each other, form a secure foundation for the top of the crate. They also form a solid surface on the same level with the top of the splashier back. The strength of the fibreboard is exemplified by the fact that four men have stood on the top of the crate without damage to the load or container.

Pre-Fabricated Crates

With all interior packing in place, the pre-fabricated $30\frac{1}{2}'' \times 44\frac{1}{2}'' \times 45\frac{1}{16}''$ shipping container is lowered over the top of the range. The crate is constructed of strawboard which is stapled to wooden runners for rigidity; the runners are nailed to each other. Three longitudinal runners and two lateral runners plus the strawboard constitute each side and the top.

Attached to the inside of the back panel of the crate are corrugated pads measuring $3\frac{3}{4}'' \times 34'' \times 1''$. These pads further act to float the range and prevent it from rubbing

the sides of the container. The back of the crate is hinged to facilitate placing the container over the range. Three men require only several seconds to complete the job. The crate is nailed to the skid base. Finally, serial numbers, the model of the range and other data are stamped on the side of the crate.

The skid-type construction of the bases is designed for entry of a fork truck, which transfers them to storage or to rail cars. The crates are picked off the end of the conveyor by the truck.

We have found that our internal and external packing has met all the requirements set forth in the first paragraphs of this article. 1. The packing is strong enough and so designed and placed to protect the range from damage normally encountered during shipping. 2. The crates are compact enough so they do not add extra volume to each unit and we are able to ship a maximum number of ranges in each rail car or highway vehicle. 3. Internal and external packing does not add much to total weight.

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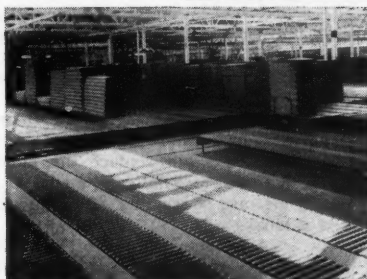
PRODUCTION is rolling along BUSCHMAN Conveyors in this noted corrugated board manufacturer's Chicago plant.

This company's engineering department and Chicago Plant Manager have also commended BUSCHMAN on the trouble-free installation of such a large project.

This installation is just one example of widely-varied Buschman experience in practically every industry. There is a BUSCHMAN Engineered or Standard Conveyor to meet your needs. Write for additional information . . . no obligation. Agents are located in all principal cities.

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The photos show the large warehouse space in which BUSCHMAN roller conveyors have materially speeded up the handling time while reducing the handling costs.

S.I.P.M.H.E. TALKS . . .

(Continued from page 42)

ethylcellulose may be expected to produce a great many new containers within the near future.

This mention of bags is a reminder of the rapidly expanding use of bags. Multiwall paper bags are being produced in all kinds of combinations of materials, some of which are included in the list of special bags given in the Consolidated Freight Classification. There are wide possibilities in this field. Bags have been produced in which the inner ply consists of kraft paper coated with polyethylene in order to make the

bag resistant to greasy contents. Another interesting improvement in multiwall bags is that of impregnating them with pyrenones in order to prevent infestation of the contents by insects. This material is applied to the outside of the bag and since it is toxic to insects the result is their death or immobility before they can attack the package. The treated bag on the other hand is non-toxic to humans.

This suggests, too, the vast field of prepackaging of fresh vegetables. There is a revolution going on before our eyes in the marketing of these articles, and in this revolution packaging is playing a very important role. An equally important role is taken by packaging and wrapping machinery.

which has shown its value in crowded areas where it is necessary to lift the load. This is particularly valuable in our case as we have found excellent use for it in the loading of the industrial railroad where aisle space is at a premium.

The use of the power hand truck in the machining aisles means that we have more or less standardized on the application a combination of the industrial railroad and fork trucks to bring material into the building, powered hand trucks to move it through the various operations of machining, welding, etc., and again using the combination of fork truck and the industrial railroad to remove it from the machining and welding area to the assembly lines. At this point the process is again repeated whereby trains are unloaded with fork trucks and material taken from the unloading point into various assembly areas with hand trucks or powered hand trucks. . . .

The biggest weakness in most plants where mechanical handling has been introduced is that sufficient consideration is not given to repair and maintenance of equipment. It is so easy to visualize the improvement in operation that can be achieved by the purchase of additional equipment that we are prone to overlook the importance of proper maintenance.

Preventive maintenance at the right time will reduce repair bills, avoid costly delays and increase the number of operating hours. It is not the number of trucks in your plant but how many hours they operate that is all-important. I would urge those who may be considering the purchase of additional equipment to study their maintenance facilities and see that they keep pace with the program of modernized handling. A new fleet will disintegrate in a short period of time unless properly maintained.

We are now in the process of erecting a building to be known as the automotive repair shop. This building will cover over 20,000 square feet of floor area and will house complete and modern facilities for servicing materials handling and automotive equipment.

At the time we started into the program of modernizing our materials handling we were in a tight labor area. Even though the labor market has eased since then it still holds that men are no longer interested in doing heavy manual labor. Not only is the rate of turnover reduced when the job can be sensibly mechanized, but where practically applied it means that the job can be done quicker and cheaper and the available labor utilized for more skilled operations. For years we have recognized in the machine shop that to make a man's job easier is to make it more profitable both for the employee and the company. It is extremely encouraging to me to see this thinking carried into the field where it was almost accepted as inevitable that manual labor was the only way to unload a box car.

Production Progress Through the Revamping of Materials Handling Methods and Equipment

By W. L. NOUMANN

Production Manager
Caterpillar Tractor Co., Peoria, Ill.

"Men are no longer interested in doing heavy manual labor . . . a sensibly mechanized job reduces the rate of turnover."

WE began studying our supply lines and the problem of improved mechanical handling late in 1945. We decided at that time to make an exhaustive study of our material handling problem and to defer the purchase of any equipment until specific recommendations for an overall program could be made. The job of analyzing this problem was given to a man well qualified for the assignment. It took six months to complete this study and to formulate the foundation for a modern mechanized handling program. . . .

In our experience with pallets we have probably covered the same thorny path traveled by many others in their search for the ideal or standard pallet. We have two distinct problems in handling material suitable for palletizing. One has to do with rough material stored outdoors under all weather conditions; the other has to do with indoor storage of purchased finished goods. After considerable experimenting with various sizes of pallets for outside storage we have standardized on a 32" x 42" size. After trying various types of wood pallets and wood and metal combinations we have finally gone to an all metal pallet, of our own design, which we call a skid pallet. . . .

The work of developing palletized loads with our various vendors has been a very interesting one. We approached this with several basic ideas in mind. We wanted to receive, insofar as it was practical, unit loads in the kind of a package that would lend itself to economical handling in our plant. We were also interested in receiving such loads at no additional cost and approached the problem, with the cooperation of the vendor, by developing a package that would improve his

handling efficiency in his own plant. We are enthusiastic about results so far. . . .

Probably one of the most outstanding developments in our handling program has been the widespread application of the power hand truck. Our machine shop aisles are not wide enough to permit easy access with a fork truck. Even in the construction of new manufacturing facilities it did not seem to be advisable to devote so much floor area to aisle space simply to be able to use a fork truck in the processing aisles. It has been our past practice to move material through these aisles by means of a hand truck. Only where the loads were too heavy did we endeavor to struggle in these aisles with a power truck. In many cases we had a man pulling a hand truck and another pushing as well. This was also true in the assembly areas where material was stored prior to assembly. In many cases it meant interruption of machine operation as the operators endeavored to help the hand trucker move heavy loads.

The power hand truck has been the ideal answer to this problem. It relieves the trucker of a tremendous physical burden, reduces the number of people needed to perform this operation and moves material faster than was previously possible. We will probably always have a number of hand trucks in operation, but we have endeavored to analyze those spots where the job requires great physical effort or where it requires more than one man. In those cases we will replace the hand truck with power hand equipment. At present we are operating 108 power hand trucks.

A companion tool to the power hand truck is the power hand-guided stacker

Packaging, Materials Handling and Distribution and the Relationship to Production Costs

By E. B. CANDELL

Head, Packaging and Materials Section
Lamp Department
General Electric Co., Nela Park, Cleveland, O.

"The cost of packing must be considered in relation to its protective quality, and merchandising needs."

ANY manufacturer of fragile articles soon finds that packaging, particularly protective packaging, is fundamental to successful operations. The electric lamp is one of the most universally known and used manufactured articles which we have today.

Cost of the package is a very important item and by cost is meant, not only the cost of the materials making up that package, but the labor of assembly and the effect on transportation costs, both of incoming material and the shipping of the packaged article.

For many low and medium priced articles, the cost of packing, including packing labor, is kept to 2% to 7% of the list price, with the percent decreasing as the list price increases. It is our policy to hold the packing costs to the lowest consistent with what is necessary for good protection and practical merchandising.

For example, on one of our popular domestic lines of lamps selling in the

10 to 20 cent bracket, the total packing costs are over 3%, whereas on another lamp listing around \$3.00, not sold directly across the counter, the ratio is a little over 2%. On another purely industrial type selling for a little under \$100.00 the ratio is 0.5%.

There are instances where the sales or advertising divisions request a more elaborate treatment of the package. When this is done, the increased cost of such a package over the functional practical package is really a selling or advertising cost and should not be charged to packaging but to one or the other of the divisions. The inclusion of advertising or sales promotion booklets, instructions, etc. fall into this category.

Summarizing, I believe that the manufacturing group of the company expects the Packaging Section to study the article being manufactured and design packing which provides adequate protection, which is practical of as-

sembly, in a form and size attractive to the customer, as well as the distributors and dealers, and at a cost consistent with the manufacturing and selling cost of the product.

But there are still other functions which the Packaging and Materials Handling Section should rightfully perform. An alert management recognizes that there is more than just the Manufacturing Group to consider. In many organizations, this Packaging and Materials Handling activity operates in a department under the General Management direction because it has responsibilities not only to the manufacturing divisions but to Sales and Advertising, to the Warehousing and Distribution groups, to the Legal Division and the Procurement or Purchasing Division.

With such widespread activity and responsibility, an adequate organization is first required. And that organization needs proper and sufficient space and tools with which to function. This may at first seem like an extravagance, but there are few sections in an organization, particularly where the volume of the articles manufactured runs into large figures, which influence costs as well as customer reaction as greatly and quickly as does the Packaging Section.

For example, the Packaging Section must be in close contact with the Sales and Advertising Divisions and usually finds that it is frequently one of the important elements in their plans and program.

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Each Hansen Tacker holds scores of staples, and takes but a moment to reload. There are economical Hansen models for every type of operation, including self-clinching staplers for sealing bags, assembling cartons, etc.

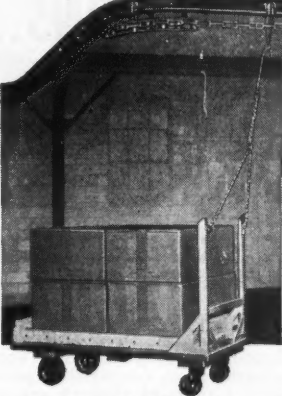
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The A-F TowA-Flow System, like all A-F Engineered Completely Co-ordinated Conveying Systems, represents 48 years of know-how. *Why be satisfied with less? Write for a discussion—today!*

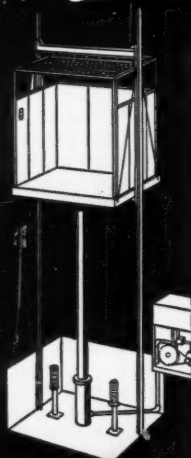
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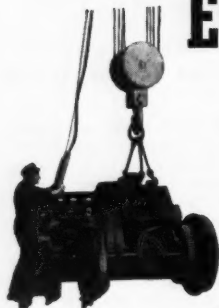


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Spot-Positioning thru ease of accurate control is an outstanding performance feature of this 25 ton crane equipped with *E C & M Frequency Relay Dynamic Lowering Control. Non-overhauling loads with empty or slightly loaded hook start down slowly since weak "down power" is permissible. Euclid builds cranes in a range of styles and capacities to meet varied requirements.

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INSTITUTE NEWS . . .

(Continued from page 23)

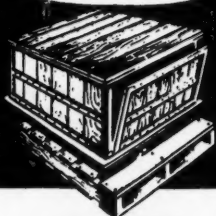
Acme Steel Co.; treasurer, J. J. Hudson. Vice president in charge of membership and publicity is C. E. Moore; vice president in charge of programs, L. A. Seversen.

110 MATERIAL handling engineers, production men and manufacturers representatives attended the September meeting of the Material Handling Society of New Jersey. The speaker was Earl G. Planty, executive counselor, Johnson & Johnson Co. of New Jersey. Planty discussed the need of production to adjust to the "buyer market" by introducing a material handling engineer as a positive means of lowering production costs. He stated that new equipment and efficient production methods are often wasted because of poor selling and lack of explanation to the employees. Planty also covered the subject of "human relations engineering."

E. F. RITER, former president of the Northeastern Ohio Chapter of the Material Handling Institute, Inc., and member of the general engineering department of the Glidden Co., Cleveland, has joined the company's Soya Products Division in Chicago as administrative assistant to the vice president. Riter, in addition to serving as president of the Cleveland material handling group, also was head of its membership committee and chairman of the executive committee. He also served as the chapter representative to the Institute.

Have you ordered your 1949-50 DIRECTORY yet? Many improvements have been incorporated in the new, revised edition. Copies are available at \$5.00 each. It will pay you to order one for your purchasing agent, engineers, and executives and supervisors in charge of production.

A New Era
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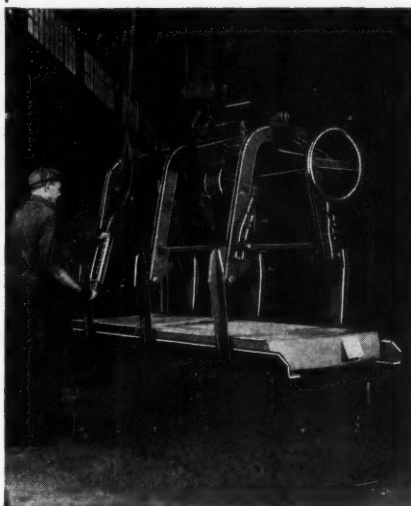
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This is the easy way to move sheet steel. One man and this C-F Lifter can handle many tons of sheets per day with ease, speed and economy.

C-F Lifters have infinite opening and closing adjustments of the jaws permitting them to handle many varying sheet widths. These adjustments are made by the operator in a few seconds.

If your production involves the use of sheet steel, a C-F Lifter will save you many times its cost in the handling speed and economies it will effect.

Write for the bulletin "C-F Lifters". It illustrates the many advantages of these material handling tools.

C-F Lifters are made in sizes to handle 2 to 60 tons in standard and semi-special designs.

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HANDLE SHEETS
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Is your Materials Handling **ACCIDENTAL** or **ENGINEERED ?**



Dolly & Flat Trucks
Low Platforms



Two Wheel Trucks



Box and Four
Sided Trucks



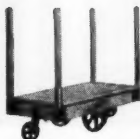
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Makes Over 1000 Standard and Special
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In many businesses, the handling of materials has grown on a "hap-hazard" basis, as the business has grown. If this is true in your case, you will be surprised at how much your whole production program can be speeded up—and your handling costs reduced—by a properly engineered materials handling system and selection of trucks exactly suited to each type of work. More than 1,000 truck designs have been developed in the Nutting line because they were needed.

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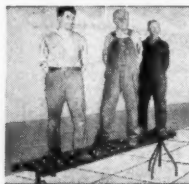
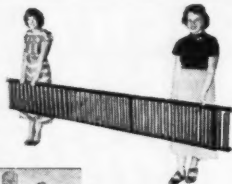
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**BUT
CARRIES
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Speedways Gravity Conveyors are so light in weight that even a 10' section is easily portable.

Where you are moving products with flat bottoms use Speedways Wheel Conveyors, otherwise use SpeedTUBE Roller Conveyors.

Available from stocks in principal cities, standard 5' and 10' lengths, 45° and 90° curves and widths of 12", 15", and 18".

Write for literature on Speedways Conveyors complete line of light duty gravity conveyors and endless belt boosters. We will also tell you the Speedways representative nearest to you.



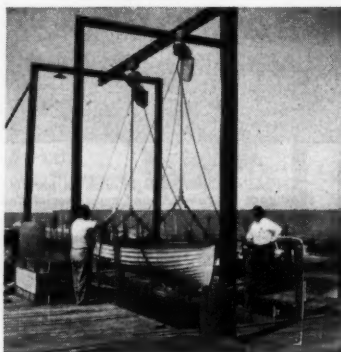
1242 Niagara St., Buffalo 13, N. Y.
Stocked by experienced Materials Handling Engineers in principal cities. Also manufactured in Canada.

"Self-Serve" Boat House

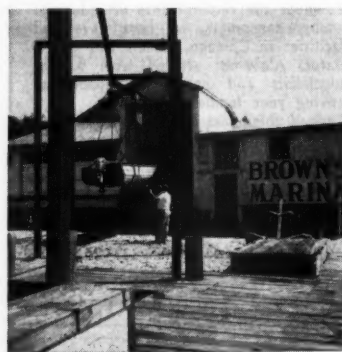
Now the self-service idea has been extended to boat houses. Worthy R. Brown & Son, Inc., Lakeside, Ohio, operates a "self-serve" boat house. This firm rents storage space to customers at the rate of \$75.00 per year, gives them the necessary handling tools to get the boat to and from storage and the water, and leaves the rest up to them.

While the use of hoists for handling boats in and out of the water is not unusual, this company is one of the few which has incorporated the "self-serve" feature to keep cost to customers at a minimum.

It's strictly a one-man operation—and an easy one. According to Owner Wm. R. Brown, the use of modern handling equipment has enabled



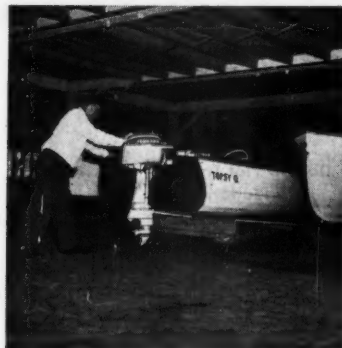
BOAT IS HOISTED from the slip and . . .



PUSHED TO entrance of boat house where . . .



IT IS LOWERED onto castered dolly and . . .



ROLLED TO designated storage location.

persons living some distance from the lake to own and care for a boat at a minimum of cost. Safe, easy handling is a big sales point, both for young and old boat enthusiasts. More than 25 pleasure craft measuring up to 18 ft. in length are stored in this boat house.

The boat is raised from the slip by one man with the aid of two ½ ton electric hoists and rubber-hose-covered wire rope slings. The boat is pushed to the building entrance, then hoisted to floor level. In the doorway, the customer lowers the craft onto a dolly which rolls on three steel casters. The keel of the boat fits into a slot on the concave "bunk" of the carrier. The boat is then rolled to the designated floor location. It's the same easy one-man job when the boat is taken to the water.

ON THE PALLET . . .

(Continued from page 26)

concept of warehousing, material handling and shipping, and is expected to revolutionize present methods in these fields.

An underground drag-line system pulls especially designed trucks through aisles along which some 500 different items are stored. An order assembler precedes these trucks, taking merchandise from piles of goods stocked on pallets. An order calling for hundreds of different items can be assembled and shipped within a matter of hours, whereas previously as much as several days time were required. A four-wheel drag-line truck, a hand-operated label applicator, and a motor-driven dockboard are the new inventions designed to better efficient operation.

FROZEN coffee is the "hottest" food item on the market today. It had its beginning during World War II when two GI's decided to be their own bosses after the war. When Lloyd Rudd and K. C. Melikian, both 29 years old, formed their corporation in Philadelphia in 1946, they did so with their invention—the nation's first fully automatic hot coffee vending machine. To go with it, they also developed frozen coffee concentrate, a unique product. They began a new industry, and opened up new fields of endeavor.

7 STAVES INTERLOCK

Each Super-Concrete Stave in a Neff & Fry Silo interlocks with six contiguous ones. The edges are grooved and beaded. The joints are so secure that grouting is not necessary, although a mastic filler is used when damp-proofing is specified.

Due to the diagonal joints, reinforcing rods impinge upon both ends of all staves. As many additional rods are drawn around the bodies of the staves as needed to resist lateral pressure.

This patented design makes the N & F Silo a structure of distinctive strength and solidity. The corrosion-resistant materials assure long life with virtually no maintenance cost.

It will pay you to get complete information. Write, wire, or phone

THE NEFF & FRY CO., Camden, Ohio



NEFF & FRY
SUPER-CONCRETE STAVE
STORAGE BINS
FOR ALL SORTS OF
FLOWABLE BULK MATERIALS



FLOW • DECEMBER, 1949

IRONBOUND SKIDS



● Still the low cost time proven method for efficient and economical handling of materials.



IRONBOUND SEMI-LIVE SKIDS



● Semi-live skids can be made for use with box tops or trays to provide tiering, space-saving mobility. You can stack, tier or handle special materials with various types of superstructures.

We can show you how a semi-live material-handling system will work in your plant to save you money. Write for illustrated literature.



IRONBOUND

FLO TRUK

● A sturdy economical truck available with single or double push handles. These trucks solve many inter-plant handling requirements. Write for literature.



ROL TRUK



THE IRONBOUND UNIT FOR SIMPLIFIED HANDLING OF PAPER ROLLS, DRUMS, BARRELS, REELS, KEGS, ETC.

● The Ironbound RolTruk will "pick-up and go" with cylindrical items weighing up to 2000 pounds. Available in models to meet most every roll handling requirement. Ask for special fully illustrated 6 page bulletin 10-RT.

IRONBOUND

BOX & LUMBER COMPANY
Materials Handling Division
30 HOFFMAN PLACE • HILLSIDE, N. J.

SKIDS • SEMI-LIVE SKIDS • DOLLIES • FLOOR TRUCKS

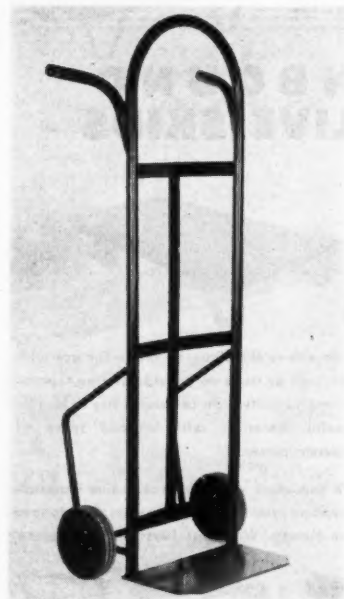
NEW

PRODUCTS

For additional information on these products, write Dept. 5, Flow Magazine, 1240 Ontario St., Cleveland 13, or use postcard bound into this issue.

HAND TRUCK

NP1—The Nutting Truck and Caster Co. has developed a new light-weight hand truck with an improved stair guide design for moving the vehicle up and down curbs or stairs. Weighing 24 lb., the truck has a 14"x47" long arched

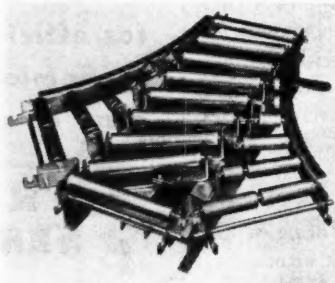


frame which securely holds stacked heavy loads. The unit is made with single or double handles; 7" or 9" plate nose or 7" open nose. Demountable aluminum alloy wheel centers with roller bearings and grease fittings. A choice is given of 6 x 2.00", 10 x 2.00" and 10 x 2.50" puncture proof semi-pneumatic tires.

CONVEYOR SWITCH

NP2—A switch developed for straight-through, to the left, or to the right travel of commodities from a main line, for use with standard Litewate Roller or Wheel conveyor, is being manufactured by the Standard Conveyor Co. It consists of a series of pivoted straight rollers, forming the central or main line, which can be manually turned to the left or to the right. The rollers may be set straight so as to provide straight-through travel. These pivoted rollers are controlled by a hand lever, extending

on both sides of the switch, so that control is possible from either or both sides. The switch is complete with 45-degree



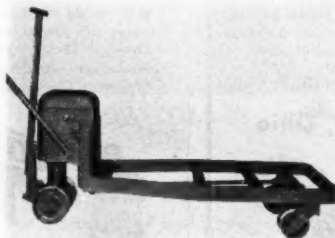
curve spurs on both sides and is fitted with hook and rod couplings, so that straight or curved sections may be quickly attached to the switch.

6000 LB. HYDRAULIC LIFT TRUCK

NP3—Barrett-Cravens Co. is offering the new Barrett Model MD hydraulic lift truck for handling by one man of skid and pallet loads up to 6000 lb.

The features of this single frame truck include a compactly packaged hydraulic system in a streamlined housing. The hydraulic pumping unit is self-contained; there are no oil lines.

High underclearance is another characteristic of the new MD lift truck. It has a lift of four ins. This feature makes this truck especially suitable for loading and unloading motor trucks,



and for other operations where short steel ramps are employed.

The telescopic lift handle with its readily adjustable length permits the use of this truck in narrow quarters. The spring handle hold-up keeps the handle off the floor and out of the way when the unit is not in use. To unload, the operator steps on the treadle and the load is gently lowered to the floor.

The model is built in widths of 20 and 25 ins., with platform lengths from 36 to 72 ins. This unit is also available in a twin-forked model for handling pallets.

BATTERY CELL-FILLER

NP4—A new Exide Battery Cell-Filler is announced by The Electric Storage Battery Co. It is designed to enable maintenance men to add water to storage batteries used in electric industrial trucks and tractors, quickly, accurately and easily. The filler consists of a tube with a nozzle at one end and at the other a handle which is equipped with

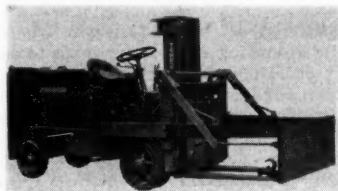


a valve operated by finger control. At the valve or handle end is an electric signal lamp which flashes a warning when the water in the cell reaches the correct level. The lamp is operated from five dry cells carried in a small steel case attached to a canvas belt, which goes around a maintenance man's waist; or from a 115/6 volt transformer. The nozzle is molded of tough rubber.

DIE FORK TRUCK

NP5—The equipment pictured is designed for carrying of heavy dies weighing thousands of pounds to and from the die table of a press. Developed by the Towmotor Corp., the new unit is known as Unloader. The die is picked up on the forks of the lift truck, transported to the press, and deposited on the die table by extending the steel pusher plate of the hydraulically operated unit. It has a capacity of 8900 lb. at 25" load center and a lift height of 72". To remove the die from the table of a press, a length of chain is passed around the die and linked to hooks at each side of the pusher plate. Then, by retracting the Unloader arms,

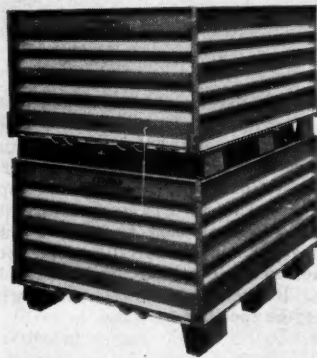
the die is pulled onto the truck forks. To unload the die, the truck operator merely extends the hydraulically oper-



ated steel pusher plate and deposits the die. The equipment is recommended for handling many types of dies, jigs and fixtures, and for placing them in position on various types of machines.

RETURN-O-TAINER

NP6—These pallet boxes, available from the Fab-Weld Corp., are designed and built for intra-plant shipment of semi-processed and finished parts, castings, forging and stampings. They may also be used for short or long distance transportation of bulk products, such as foodstuffs, fruits, vegetables, etc. Positive-locking, hinged sides fold flat for low-cost return and small-space storage. All steel, completely welded. Corrugated metal sides, ends and bottom, specially formed for strength of

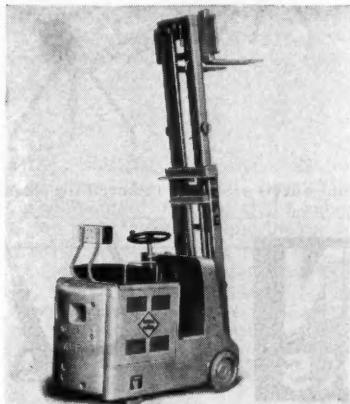


legs. Sizes: 40" x 48" x 24" deep. Correct for crosswise loading in box cars and longitudinal loading in trucks.

COMPACT HIGH-LIFT FORK TRUCK

NP7—A small gas-powered fork-lift truck designed for inter-plant material handling, and where outside work predominates, has been introduced by Elwell-Parker Electric Co. Equipped with a 17-horsepower air-cooled engine, electric generator and starter, the transmission and driving features are similar to that of an automobile. Lifting-lowering and tilting mechanisms are controlled by two levers located on the cowl at the right of steering wheel. The truck's overall length including 80" fork

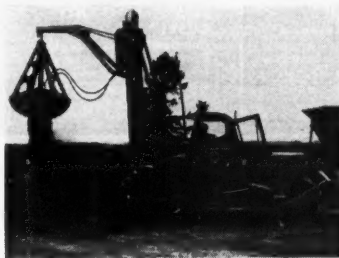
is 102"; width 32½"; height with up-rights telescoped 83½", extended 139". Maximum lift is 121½". Total weight is 3900 lb. Travel speed with 2000-lb. capacity load is 6½ miles an hour; lift speed of load 31 ft. a minute; lowering, 35 ft. a minute. Tilting angles of up-



rights and speeds are: forward 5 degrees in 3 seconds; backward 10 degrees in 5 seconds. The truck has been designed for simplicity of operation, comfort and safety for the driver.

CLAMSHELL BUCKET

NP8—A clamshell bucket attachment for the Duo-Way Scoop, made at the Portland plant of Mixermobile Manufacturers, has been announced. The new attachment is hydraulically closed and opened and has a ¼ yd. capacity. The



bucket is of welded construction throughout and suspended on an extended goose-neck boom.

Designed for extreme flexibility, the boom can be obtained in five or six-ft. lengths and is operated by a power take-off from the motor. The clamshell bucket is 69½" in overall height, 31½" in. overall width and 43" deep. According to the release, a feature of the attachment is the ease in which it can replace the scoop. One man can handle the change-over in a matter of minutes.

PALLET RACK

NP9—The "TRECO" Pallet Stacker, manufactured by the Ron Equipment Co., consists of an all-metal frame, simple in construction, and can be furnished for any size or type of pallet. Its

design is such that it is readily removable, permitting the pallets to be used with or without frames. The pallets are

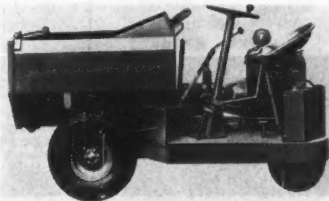


supported around their perimeter, thereby adding materially to the basic rigidity of the frames. The height is not fixed but can be easily varied to permit more pallets per stack depending on the materials being stored. The Stacker dismantles easily to facilitate loading and unloading or for storage in a small space. Its main use is for storage of odd-shaped, easily crushed, mixed or extremely heavy materials.

CIRCLE NUMBERS ON
THE CARD AND MAIL!

DUMP BODY TRUCK

NP10—The Kal-Truk is designed to accommodate two different types of material handling bodies, is a three speed forward and reverse, heavy duty truck built like a tractor. Manufactured by



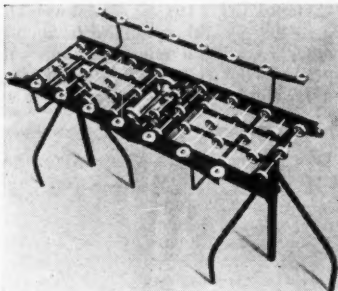
The Kalamazoo Mfg. Co., the unit is designed for material handling in the construction and industrial fields. The truck with its 2/3-yard capacity dump body is designed for direct discharge of materials from hoppers, bins or mixers into its dump body. A platform-type body is available for handling such loads as steel, lumber, brick, boxes, etc. The truck has two, close-coupled 6-in. wheels equipped with 14" x 4.50 x 6-ply tractor tread tires. At speeds up to 15 miles per hour, it has a turning radius

of 65½" for wheels and 78½" for the body, from its rear pivoting point.

AUTOMATIC GLUER

NP11—Sage Equipment Company has announced a new automatic gluer in 12," 14" and 18" widths. This gluing device is designed for carload and L.C.L. shippers, who are showing increased interest in glued unit loading. By preventing the shifting of packaged loads in transit with the automatic gluer, considerable economies may be effected in shipping fragile or crushable materials, such as canned goods, glassware, china, bottled goods, etc., it

is said. Guard rails and two glue wheels are completely adjustable. Glue pan



and wheels are easily removed for clean-

ing. Heating units to maintain glue at proper temperature are also available.

ELEVATING TABLE

NP12—A new roller conveyor top for use in moving extra heavy loads to and from a portable elevating table has been announced by The Hamilton Tool Co. The conveyor top fits snugly over the top table surface, and is held in place by a flange which encompasses the table perimeter. It may be installed or removed as required, without tools, by the simple means of positioning or lifting from position. A wedge, placed between rollers at each end of the load, prevents load from slipping during transit. Features of the table include mechanical lift, which locks the table automatically at whatever height



AMERICAN PRESSED-STEEL HAND TRUCKS

...stay on the job
for less than a penny
a day!



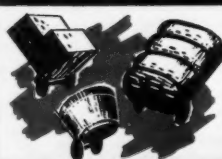
LOW INVESTMENT COST! Thousands of rugged "American" Hand Trucks are rolling along after ten or more years of hard service. Original cost is only a fraction-of-a-cent per day!



LOW OPERATING COST! Put any man in your plant behind an "American" Hand Truck and you will find he can handle any job efficiently—and safely!



LOW MAINTENANCE COST! "Americans" need practically no attention. Pressed-Steel bolted construction keeps maintenance costs down. Sealed-in ball bearings keep grease in, dirt out!



MAXIMUM FLEXIBILITY! The perfect balance achieved by the "American" design gives greater flexibility in moving materials of any size or type!



2-FOOT AISLES OKAY! "American" Hand Trucks can snake through tight spots and roll down narrow aisles. A 2-foot clearance is all that is needed for most "Americans"!



50 TYPES AND SIZES! What type of materials do you want to move? There's an "American" Hand Truck to do the job—every one equipped with the famous American "Steelite" Wheels!

Wherever materials are moved, "American" is a familiar name. These red-enamelled, pressed-steel trucks are respected for efficient material handling at lowest cost. They work for pennies—but they save you dollars. Write for the latest "American" Hand Truck Bulletin showing 50 styles and sizes built to handle any job. Stocked by distributors everywhere.

The American Pulley Company

4290 WISSAHICKON AVE., PHILADELPHIA 29, PA.



*for efficient material handling
at lowest cost!*

PAK-LOADER FORK TRUCK SYSTEM

NP13—Boxes, barrels, bales, drums, and cartons can be handled in multiple units by the application of the Yale & Towne Pak-Loader Fork Truck System. The system comprises two components, fork trucks equipped with pusher mechanisms and two or three specially adapted steel plates per fork truck. It is said to be applicable particularly where large quantities of goods are stored and which are shipped unpalletized.

The steel plates are cut to the size which best fits the specific load to be handled. Lugs about four ins. high are secured to one end of the plate. When loading the plate, a block of wood is placed under the toe to keep it level. The forks of the truck slip under the

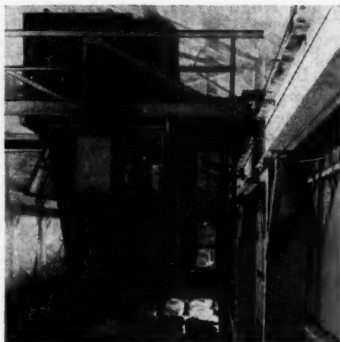
plate for lifting. When unloading, the forks are tilted forward to rest the front end of the loaded plate next to the pile of goods already stored. As the



pusher is extended, the truck moves backward. A locking device holds the steel plate on the forks and prevents it from being pushed off with the load. The plate is returned for reloading when the truck picks up another load.

AIR-CONDITIONING CRANE

NP14—This 10-ton Euclid Crane, manufactured by Euclid Crane & Hoist Co., is especially designed and equipped for



efficient operation over furnaces where high temperatures and noxious fumes are present. It is equipped with an air-conditioning unit which removes dust and cools the air, and also neutralizes the effect of noxious fumes by means of activated carbon filters. Other features include: slip ring motors with glass insulation and thermo guards; protective baffle plate under the trolley and thermo pane windows.

COUNTING MACHINE

NP15—A machine that accurately counts anything from dollar bills to World Series tickets at speeds up to 1,000 per minute has been introduced by Pitney-Bowes, Inc. An optional imprinting device permits dating, coding, endorsing or canceling while counting. Called the Model TIC "Tickometer", it is a production development of an earlier "custom" type machine made in limited quantities for special applications, chiefly in transit and amusement companies. The new model is a general purpose counting and marking machine with widespread application in business and finance. Among the items han-

dled—at speeds ranging from 500 to 1,000 per minute—are checks and currency, tickets and coupons, labels and cards, stubs and receipts, sales and production slips and even magazine cover "returns." It has two ascending counters. One is a "set-back" counter, controlled by a knob, for recording individual or partial "runs". The other, which is inaccessible and tamper-proof, records cumulative totals, it is said.

CASTERS

NP16—Industrial casters designed for heavy duty are available from The Rapids-Standard Co. In cold-forging the top plate, yoke base and button of

this new caster, tremendous pressure moves metal to points of greatest wear; grain structure of the steel is refined to increase wear resistance. A smooth, highly polished ball race finish closely resembling a ground surface is obtained, with contours of raceway fitting the ball closely to give easy swiveling action and longer wear. A dust cap prevents dirt from entering raceways and provides a means for convenient lubrication.

These casters, called Series 40, are being manufactured in five wheel types—micro-steel, durastan plastic, molded on rubber, cushion or hard rubber. Wheels are 3", 4", 5" or 6" diameters. Load capacities, which vary with types of wheels, range from 175 to 650

Lifting and loading materials, parts, etc. . . . clean-up and maintenance work . . . drawbar work such as moving machinery, cars.

Inside

Outside

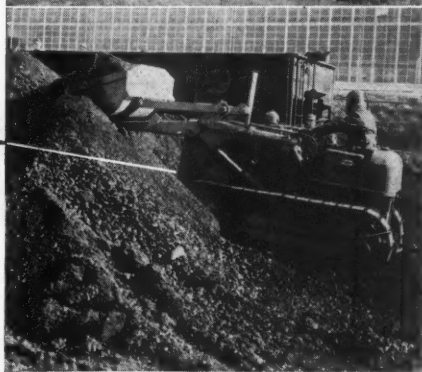
ALL THE YEAR AROUND . . .

Interchangeable Attachments

Make the ALLIS-CHALMERS

HD-5G and TRACTO-SHOVEL

a Versatile, Money Saving, All-Season Producer



Maintaining grounds and parking areas . . . bulldozer work . . . excavation . . . snow removal . . . load and unload bulk . . . stockpiling . . . spotting cars.

Here is a material handling outfit that can't be beat on many jobs, either inside or outside of industrial plants. Handling bulk . . . stockpiling . . . feeding hoppers . . . plus dozens of dozer and bucket jobs make the HD-5G Diesel Tractor with Tracto-Shovel an invaluable, ever-busy investment in speeding up your operation, cutting down your costs.

Tractor weight 11,250 lb., 40.26 drawbar hp., 50.25 belt hp.

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

ATTACHMENTS

- 1 Cu. Yd. Standard Bucket
- ¾ Cu. Yd. Narrow Bucket
- 2 Cu. Yd. Light Materials Bucket
- 1 Cu. Yd. Rock Bucket
- 1 Cu. Yd. Magnesium Bucket
- Drag Bucket
- Teeth For All Buckets
- Heavy Duty Bulldozer Blades
- V-Type Snowplow

Allis-Chalmers builds a wide line of wheel and crawler tractors for material handling of all kinds—loading, carrying, pulling. See your Allis-Chalmers tractor dealer or write for literature.

pounds. Casters in this series are equipped with thread guards when desired.

**CIRCLE NUMBERS ON
THE CARD AND MAIL!**

TELESCOPIC GRAVITY CONVEYORS

NP17—Telescopic gravity roller and wheel conveyors are available from Maguire Machinery Co., Inc. They are designed for use between platforms and trucks and freight cars. According to the manufacturer, the units may be retracted as the vehicle fills up or empties, effecting a smooth flow of the product on the riding surface. Additional applications for the conveyors are in stockrooms, shipping rooms, packaging departments, warehouses and receiving departments. Both types weigh 80 lb., and are 124 ins. fully expanded, 54 ins. collapsed. They are formed of 16 gauge sheet steel and can carry up to 75 lb. per sq. ft.

ROLLER CONVEYORS

NP18—Lightweight but sturdily constructed, tubular (roller) conveyors are now being offered by Speedway Conveyors, Inc. Known as SpeedTUBE,

these roller conveyors provide gravity conveyors for the rapid movement of unpackaged as well as packaged items. Built to support 600 lb. in a 10 ft. section, SpeedTUBE frames are made of hot rolled 2" x 1" x 1/8" channels with welded T section cross members. Ball bearing rollers are made of 18" gauge steel with 2" diameter ball bearings mounted at each end of hardened steel axle. The units are easily connected, it is said. Rollers are so assembled in the frame that on one side they are higher than the frame, permitting handling of units wider than the conveyor. When inverted, the surface of the rollers are below the frame, which then acts as a guard rail. The conveyor is built in 12", 15", or 18" widths, in 5' and 10' straight lengths and 45° and 90° curved sections. Tube spacing can be 3", 4 1/2", 6" 9" and 12" apart.

FOUR-DRUM-HANDLING ARMS

NP19—From one to four drums or barrels of material may be safely and efficiently handled at the same time with the new Four-drum-handling arms, announced as available for the Hyster Load-Grab attachment mounted on the "40" lift truck. Drums may be lifted in either horizontal or vertical position by means of hydraulic side pressure. When installed on the Revolving Load-Grab, the drum-handling arms may be used to turn over or dump drums or barrels.

Rubber-faced gripping surfaces on the arms prevent scratching.

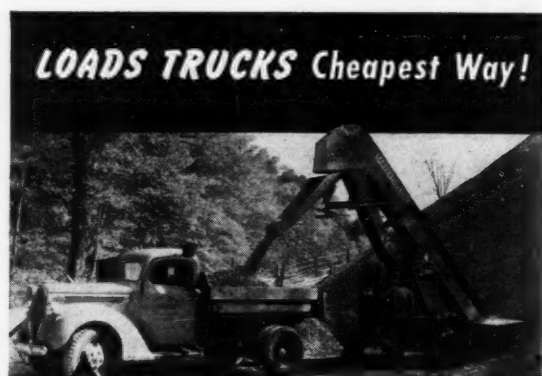
Capacity of the drum-handling arms rated at 23" load centers is 2,800 lb. with the regular Load-Grab and 2,880 lb. with the Revolving Load-Grab. Variances up to 1 1/2 in. in drum diameters are automatically compensated for in handling.

News From THE SALES FIELD

THE Lyon-Raymond Corp. has appointed A. D. Bowman, of A. D. Bowman, Inc., 48 Leavenworth St., Waterbury, Conn. as exclusive representative for the New England territory.

CONLAN & AYERS, 1022 No. 4th St., Milwaukee; this company has been appointed the Wisconsin representative for the Industrial Pallet Co., Inc. The material handling organization is headed by Harry M. Conlan, Jr. and Hugh Ayers.

APPOINTMENT of Whitney E. McDowell to the sales staff of Barney I. Florey Co., Cleveland, has been announced. Florey is the Cleveland representative for the Automatic Transportation Co.



Loader Saves Man-hours and Money!



Send for
Bulletin!

Trucks are loaded in a hurry and at small cost by one man and a B-G Bucket Loader. All types of sand, stone, chemicals, coke and small coal are loaded easily by these self-feeding, highly maneuverable machines. Truck turn-around time and cost-per-yard into the truck are cut to the minimum. Accessories for screening available. Self-propelled on pneumatic tires or crawlers. Write address below for bulletin BL522.

Barber-Greene Company

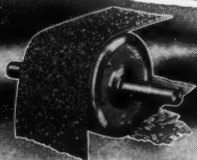
Aurora, Illinois

PERMANENT NON-ELECTRIC HOMER MAGNETIC SEPARATORS

... Proven for SUPERIOR in separating Ferrous from Non-Ferrous Metals, for protection of equipment, purifying products, concentrating materials, separating ferrous from non-ferrous parts.

FOR DEPENDABLE PERFORMANCE SPECIFY...
HOMER Permanent Non-Electric Magnetic Separators.

PLATE TYPES
PNEUMATIC HUMPS
LIQUID TRAPS



PULLEYS
DRUMS
PORTABLE UNITS

Homer engineers will be glad to assist you with your ferrous metal problems; they

are qualified to recommend the proper separators required for your work. Write us today.



The HOMER MANUFACTURING CO., Inc.
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LIMA, OHIO

Producers of Magnetic Separator Equipment Since 1923



The publications featured on these pages were written by experts. They are FREE publications. To obtain these use the postcard bound into this issue.

25—"Cab Operated Hoists" . . .

Shepard Niles Crane & Hoist Corp. is offering an eight-page pictorial folder on its numerous types of cab-operated hoisting units, including some pendant-controlled designs. Capacities range from 500 lb. to 20 tons. Included are twin hook cab controlled monorail hoists; floor controlled twin hook types; pulpit operated grab bucket hoists; monorail hoists and transfer cranes; cupola charging hoists on transfer cranes. Several dozen photos picture as many industrial applications. These range from coal handling to tanneries and from automobile plants to warehouses. Attachments include clamshells, magnets, grabs and hooks. The pictorial treatment of the subject makes an exceptionally interesting presentation.

26—Shipping Containers . . .

"The General Box" is the title of a 12-page booklet issued by the General Box Co. The literature contains three case studies showing the company's wire bound crates in use by various industries. The first pictures and describes the use of these crates for shipping 340-lb. ice cream cabinets. One of the photos shows the units tiered three high in a warehouse. The second case study shows the assembly of a small production machine on a crate base with the top and sides being attached at the end of the line. The third study pictures the handling, packaging and shipping of mahogany corner cabinets. Explanatory text accompanies the photos.

27—Gravity Conveyors . . .

Gravity wheel and roller conveyors are the subject of a six-page folder available from E. W. Buschman Co. A number of photos show both types of units in various industrial applications, including loading and unloading vehicles, in storage areas, and as processing lines. Additional pictures and descriptive material stress construction features and components. Information is given on curved sections, mobile units, stands, and coupling units. Other literature available from the company deals with its line of hand trucks and powered portable belt conveyors.

28—Steel Strapping Equipment . . .

The Stanley Works has released a brochure depicting its line of steel strap-

ing, equipment and accessories. The publication presents such topics as "How To Load" and "How To Operate" strapping equipment. Photos and line drawings accompany the text. Two pages are devoted to a complete breakdown of a strapping tool, with each component pictured and identified. Other photos show strapping equipment used in conjunction with such items as cased axes, chairs, hardware, tea, and bundles of veneer panels and shingles.

29—Forgings and Lifting Clamps . . .

Merrill Brothers is offering Catalog #51 on its line of drop forgings and material handling devices. Its 30 pages cover such topics as type of forgings; where and how to use forgings; turn-buckle dimensions, strengths and related data; Clevis Nut data; and eye bolt sizes, types, dimensions, etc. The literature contains technical information, tables, drawings and photographs. According to the release, it is the company's first catalog in three years and its only complete publication since the war.

30—Elevator and Dumper . . .

Colson Equipment & Supply Co. has issued an eight-page booklet illustrating and describing its Cesco Dumper. The unit is designed for lifting, up-ending and dumping bags, boxes, barrels and drums. Photos show industrial applications. Varieties and sizes available are given.

31—Pallets . . .

Pallets are the subject of a folder released by the Hopkinsville Pallet Co. Double-face, non-reversible; double-face reversible; stevedore, stringer type two-way and four-way entry type pallets are pictured and described. Product features include lumber finished to desired thickness; chamfered edges for hand or powered fork truck entry; squared and pre-drilled boards for cement-coated drive screw nails; spacing for wheels of hand-lift trucks. The company also offers information on an expendable pallet, skeleton type, for storage or shipping.

32—Conveyor Belting . . .

"Safety-Grip Rough-Top Belting" is the subject of a pamphlet issued by the Quaker Rubber Corp. The surface is composed of thousands of rubber tentacles to grip and hold extremely slippery ma-

terials. Ice, tin plate, glass and other smooth surfaced substances can be satisfactorily conveyed up steep inclines without rolling and slippage, it is said. The product is also designed for adjustable portable belt conveyors. Several application illustrations are featured. Other products manufactured by the company are also pictured and described.

33—Hydraulic Truck Docks . . .

The Wayne Pump Co. is offering folders on its line of hydraulic tilting loading dock ramps. The units are installed as an integral part of truck docks. When a vehicle arrives, the docks are raised until they are flush with the truck bed. When not in use, they are easily lowered out of the way. The ramp automatically levels to the truck bed as the vehicle's springs expand and contract during loading and unloading. Several dozen photos show the units in use at various plants, under a wide range of loads. Engineering drawings.

34—"Bulldog Steel Skid Boxes" . . .

is the subject of a folder issued by McConvry Mudge Ltd. Eight models are pictured and described in detail. Models are constructed with hairpin lugs for tiering; and with long crane lugs and side openings. Another unit is designed with open ends for carrying long objects and can be picked up from any of the four sides and tiered. Corrugations on the boxes are approximately 1" wide by 1/2" deep, spaced on 3" centers and have 3" radius on the corners. All upper flanges are reinforced by overlapping. The back page of the folders gives information needed for a quotation, also engineering drawings to aid the purchaser.

35—Elevator-Hand Truck . . .

Leigh Industries has issued a catalog sheet picturing and describing the Lift-Master, a combination portable elevator and hand truck. The unit handles up to 500 lb. on an 18"x30" platform. The platform is lowered to the floor for loading—it is tapered at one end. For transporting, the load is held much the same as on a hand truck and rolled on 10" rubber tired wheels. When the unit is fixed in a vertical position, the platform may be raised by a crank to a height of four ft. and used as a portable elevator. Specifications, operating features and descriptive data and photos.

36—Disc Wheels . . .

A richly illustrated 34-page catalog on disc wheels and related units is available from the Electric Wheel Co. Topics covered include ball type wheels; open center wheels; standard implement wheels; tractor type wheels; and discs for demountable rims and variable tread. Steel tire disc wheels, brake drums, axles, hub caps, and wheel bolts are also included. Each grouping is supplemented with photos, specifications and detailed engineered drawings.

Handle Your Materials with load-floating cost-cutting



Trucks

More stuff handled with less effort and cost when your plant is equipped with Colson trucks. Hand trucks, barrel and drum trucks, platform trucks, dish trucks, Lift-Jack Systems, dollies, wheels and casters—all designed for ease of movement, floor saving, extra durability. Less "push" means popularity with workers, profits for you. Write us or consult your phone book for the local Colson office.



WRITE TODAY
FOR FREE
56 PAGE
CATALOG

Colson Drum Truck model #6055-65, has ballbearing 10" double steel disc type wheels, demountable cushion rubber tires, rugged lightweight tubular steel frame. Chimb hook locks semi-automatically.

THE COLSON CORPORATION

ELYRIA, OHIO

CASTERS • LIFT JACK SYSTEMS • INDUSTRIAL TRUCKS

REMEMBER This Trade Mark!

This familiar sign of Supreme pallets is your guarantee of dependability.

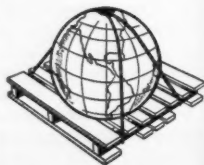
Rugged Supreme pallets and tote boxes are now at lowest prices, but with no sacrifice in quality.

Manufacturing economies plus a source of lumber right at our door make it possible for us to offer the finest products at mass-production prices.

Engineered for high-speed handling and expertly constructed of kiln dried lumber, sturdy Supreme pallets are available in both hardwoods and softwoods.

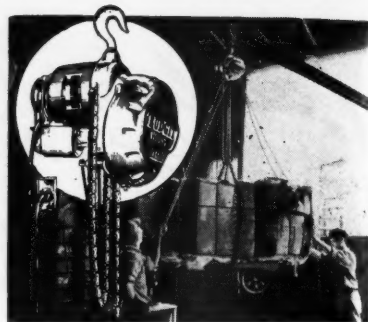
Wire or write your inquiries and requirements today. We're prepared to ship promptly in any quantity—from 1 to 50 carloads from one of our five mills located nearest you.

Representatives—a few active territories still available for our fine line. Your inquiries are solicited.



OZARK MASTER PALLETS
Move the World

SUPREME MANUFACTURING CO.
Bergman, Arkansas



for management and workers - - -

Management and workers, alike, profit when easy-to-operate, portable 'Budgit' Electric Hoists take over all load-lifting jobs.

Management sees an immediate increase in production, a cut in operating costs, lower compensation payments, greater profits from the first lift of a 'Budgit' Hoist.

Workers benefit, too, by jobs made easier. Lower compensation payments mean safer jobs for them when sprained muscles, torn ligaments, wrenched backs are out. There's no over-fatigue for them. They're free to enjoy family and friends when evening comes, take in a movie.

Check your entire plant, warehouses, loading and unloading platforms for spots where fast-lifting, safe-to-operate 'Budgit' Electric Hoists could do your lifting and save money for you.



Made in sizes to lift 250, 500, 1000, 2000 and 4000 lbs. Prices start at \$119. Write for Bulletin No. 391.



'BUDGIT'
Hoists

MANNING, MAXWELL & MOORE, INC.
MUSKEGON, MICHIGAN

Builders of 'Shaw-Box' Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of 'Ashcroft' Gauges, 'Hancock' Valves, 'Consolidated' Safety and Relief Valves, 'American' Industrial and 'Microsen' Electrical Instruments.

OPPORTUNITIES

Men wanted Jobs wanted Lines available

Rates: for "Positions Wanted" \$4.00 minimum, limit 25 words. For all other classifications \$4.50 minimum for 25 words, each additional word 15c; boldface type or all capitals, \$7.50 minimum for 25 words, each additional word 20c; limit 50 words. Box address count as five words. All insertions are payable in advance.

These classified columns are not intended for the advertising of new products by manufacturers, their representatives, or their distributors. These columns are limited to Help Wanted or Positions Wanted advertisements, and for the offering of used equipment by the users of such equipment.

FOR SALE

FOR SALE—1 Rapids-Standard Model SJA-16-10 $\frac{3}{4}$ Stevedore Junior, 16 ft. long, 12 $\frac{1}{4}$ " wide to accommodate 10" wide belt of buyers preference. Unit equipped with $\frac{3}{4}$ HP General Electric straight drive motor, wired 115-volt-60-cycle-1 phase-AC, Worthington variable speed drive, and Winfield Smith reducer B58. Controls are a Cutler Hammer start, stop and reversing switch. Unit has a toggle stand with two 6x2 rubber tired wheels at drive in and a toggle stand with a horse shoe dolly equipped with three rubber tired casters at the take up end, unit has no feeder section belt or guard rails. It was purchased March 1948 and was used for only a month. Unit is in perfect operating condition. PRATT-WEBB PIES, 1106 Carnegie Ave., Cleveland 15, Ohio.

CHAIN HOISTS

Yale model BB, 5-Ton used 30 days. Cost over \$300—sale price \$195. Round & Son Superior, 2-Ton \$50. Cliff Barr, P. A. Geier Co., 540 E. 105 St., Cleveland 8, Ohio.

LINES WANTED

South Bend—Mishawaka Manufacturers Representative seeks material handling equipment exclusive lines. Considerable experience. College graduate. Married. Louis Hansman, 408 E. Pokagon, South Bend, Indiana.

Well established material handling company—headquarters in Milwaukee—covering State of Wisconsin—desires mobile Fork Truck to round out line. Three material handling engineers employed. Can render good service and give complete state coverage. Weld-Bilt Products Company, 222 East Mason St., Milwaukee 2, Wisconsin

USED EQUIPMENT WANTED

WANTED

Fork Lift Trucks Warehouse Trailers
Hand Pallet Truck (Rubber Tires)
Hand Electric Trucks Crane Cars
We Pay High Prices for

USED HANDLING EQUIPMENT

A. & A. MACHINERY CORP.
1267 Flushing Ave., Brooklyn, N. Y.

Better, Bigger Directory

New, improved features have been incorporated in the 1949-50 FLOW Directory. More definitions and sketches; revisions for easier and more complete reference. Copies are \$5.00 each. Send your order to the FLOW Directory, 1240 Ontario St., Cleveland 13, Ohio.

Mor-Merit

pallets to your specification

STAY "ON THE JOB" LONGER WITH LESS MAINTENANCE COST

Looking for a pallet that will stay on the job and stay out of the repair shop? Then consider the advantages of consulting with our pallet specialists.

By consulting with materials handling engineers, our representatives have been able to point out the MOR-MERIT quality details in pallet construction which enabled many large pallet users to make substantial savings through lower maintenance costs.

FOR BETTER
PALLET-EXPORT BOXES
BLOCKING-CRATING
DEAL WITH EXPERIENCED
LUMBERMEN



WRITE FOR HELPFUL
PALLET CONSTRUCTION DATA

A postcard brings accurate data based on our 25 years of lumber experience and the latest findings of Forest Products Laboratory.

MORGAN LUMBER SALES COMPANY

665 E. BROAD ST., COLUMBUS, OHIO

EMERY

HYDRAULIC CRANE SCALE

For efficient "on-the-crane" weighing... saves time and material handling.

Direct reading—capacities to 30,000 lb. Guaranteed accuracy... each scale calibrated at factory. Prices from \$882 to \$1385. Complete literature upon request.

THE A. H. EMERY CO.

STAMFORD, CONN

Conveyors

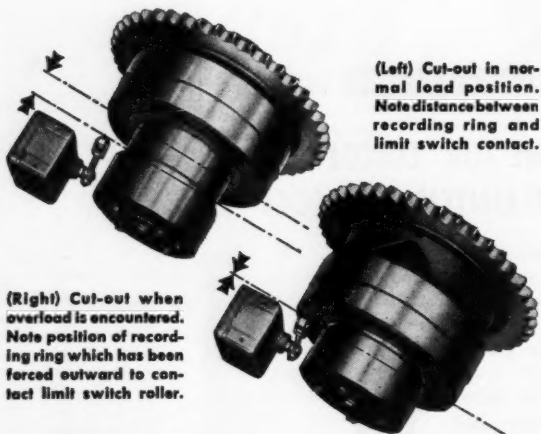
AND MATERIALS HANDLING SPECIALTIES

The Anchor Steel & Conveyor Company is an organization of practical engineers which for more than twenty years has been designing, manufacturing and erecting conveyors and conveyor systems throughout industry. Many of these projects have included conveyors for unit and final assembly operations.

In addition, Anchor engineers have developed specialties that have proved extremely valuable in mass production. One of these is the Pan Type Quench Tank Conveyor which prevents small parts from the heat treat furnace from getting lost in the tank.

Write for Bulletin
36-1

Pan Type Quench Tank Conveyor which delivers all of even the smallest parts to the unloading station.

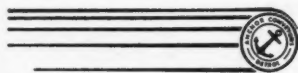


Another is the Overload Safety Cut-out which eliminates down time when a conveyor suddenly encounters an overload. Without this device a drive pin would be sheared off and would have to be replaced while everyone on the assembly line waited.

The Overload Safety Cut-out protects the conveyor and drive but it allows the conveyor to be started again immediately the cause of the overload is removed—no waiting to replace shear pins. Write for Bulletin A-46.

2414

ANCHOR



STEEL AND CONVEYOR COMPANY
6906 KINGSLEY AVENUE • DEARBORN, MICHIGAN

Literature Available From Advertisers In This Issue

(Check corresponding numbers on the enclosed card for the free literature listed below).

A-1. THE OLIVER CORP. will send information on its line of industrial tractors designed for snow removal and other outside tasks.

A-2. THE AUTOMATIC TRANSPORTATION CO. Data is available on savings with the company's electric trucks.

A-3. LINK-BELT SPEEDER CORP. is offering Book No. 2503 illustrating and describing Link-Belt Speeders, shovel cranes.

A-4. MOBILIFT CORP. An illustrated folder gives operating particulars on its line of fork trucks.

A-5. STEPHENS-ADAMSON will send complete information on the conveyORIZED handling of bulk materials in various industries.

A-6. TRUSCON STEEL CO. Descriptive literature covers its complete line of foundry flasks, steel boxes and skid platforms.

A-7. LAMSON CORP. Bulletins are available on conveyors, automatic pallet loaders, and pneumatic tube systems.

A-8. ACME STEEL CO. "Savings in Shipping" is the title of a booklet describing economies with steel strapping.

A-9. STANDARD CONVEYOR CO. Bulletin FL-129 gives full information on the company's general line of conveyors.

A-10. THE ROSS CARRIER CO. is offering complete details and performance data on its line of lift and straddle trucks.

A-11. KIMBERLY-CLARK CORP. "Float Packaging" illustrates features of the company's protective packing material.

A-12. MELOOZ MFG. CO. is offering details on its Drum Upending Bar designed for raising 450-lb. drums.

A-13. E. W. BUSCHMAN CO. will send information on its line of standard and engineered conveyor installations.

A-14. A. L. HANSEN CO. A folder describes its line of tacking equipment used with cases, bags and boxes, etc.

A-15. THE ALVEY-FERGUSON CO. A publication illustrates and describes its overhead flexible truck towing system.

A-16. NUTTING TRUCK & CASTER CO. Bulletin 48-G contains data on many types of hand and platform trucks, wheels and casters.

A-17. IRONBOUND BOX & LUMBER CO. is offering Bulletin 10-RT on its line of standard skids, semi-live skids, and platform trucks.

A-18. ALLIS-CHALMERS will send literature on industrial tractors with interchangeable attachments for inside and outside duty.

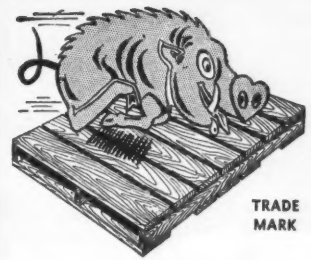
A-19. BARBER-GREENE CO. Bulletin BL522 contains valuable information on bucket loaders for highway vehicles.

A-20. HOMER MFG. CO. An illustrated folder contains data on permanent magnetic non-electric separators.

A-21. SUPREME MANUFACTURING CO. will send information on its line of pallets and tote boxes.

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See LIGHTWEIGHT RAZORBACK Brand PALLET

If your pallet loads do not exceed 2,000 pounds, we can supply you with a light weight pallet that will give long service with low maintenance cost. They weigh 20% less than standard pallets and are lower in price. Also, increase your pallet life by specifying rounded corners—an improvement that reduces damage to palletized merchandise.

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CESCO DUMPER HANDLES BAGS, DRUMS AND BULK

MULTI-PURPOSE DUMPERS for dumping bags, bulk or drums, as well as single-purpose types save handling time and reduce accidents. Dumping heights range from 5 to 12 ft. Special sizes made on order. Have lifting capacity of 500 lbs.; handle up to 100 loads per hr. ½ H.P. motor controlled by push button. Immediate delivery. Write for 8-page catalog.



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Presenting
THE
WORLD'S FINEST
5-TON FRONT BOOM CRANE
AT THE WORLD'S LOWEST PRICE

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INDUSTRIAL CRANE

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SILENT HOIST & CRANE CO.
888 63rd STREET, BROOKLYN 20, N. Y.

PALMER-SHILE

MATERIALS HANDLING EQUIPMENT

Designed to do Specific Jobs Better



All Steel Welded UTILITIES RACK

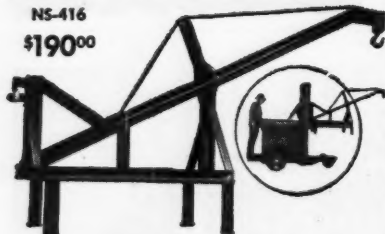
Specially designed to facilitate the handling of parts and small items in course of production or assembly. All steel, welded construction. Standard dimensions: 24" wide, 50" high, 48" long overall, 12" clearance between shelves, weight 220 lbs. Two rigid and two swivel casters.

SPECIAL SIZES can be supplied to meet any specifications or product requirement. We will gladly submit quotations.

NS-415M \$61.60
(Roller bearing 6" x 2" metal wheels)

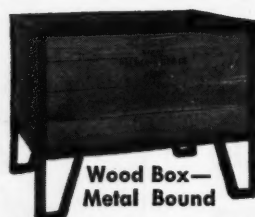
NS-415R \$63.80
(Ball bearing 8" x 1 1/2" rubber tired wheels)

NS-416
\$190.00



Boom Skid for Lift Truck

Makes a boom truck out of any standard high-lift truck; also used on fork trucks. Of fabricated steel, welded. Boom 114" long, base 54" long. Weight 350 lbs.



Wood Box— Metal Bound

For general utility use. Hardwood box, completely metal bound. Has four way lift truck entrance (side or ends). Give underneath clearance required for your lift truck.

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34" wide,
42" long,
20" deep

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\$36.05
84" wide,
48" long,
24" deep

NS-364
\$150.00
Complete
as shown



Sheet Steel Grab

Handles sheet steel bundles up to 9" thick, 18" x 48" wide, any length—without slippage, distortion or damage to stock. Grabs used single, double or triple—capacity 1 ton per grab—total 3 tons. Supporting beam 6' long. Wt. 190 lbs.



B-465B
(Weight 407 lbs.)
\$79.00

B-465Y Dump Box Yoke \$50.00

Automatic Dump Box

Designed for carrying and dumping of materials or parts—used with any hand or power lift or fork truck, also overhead hoist. Heavy gauge steel, reinforced.



B-727

Single face pallet rack with stacking corners—for handling irregular pieces. Nesting ring can be permanently welded to pallet. Special rolled channel steel. (We build all types to order.)

We design and build all types of trucks, skids, pallets, platforms, racks, boxes, bins, tables, etc.

When ordering give item number to prevent error. Weights approximate. All prices f.o.b. Detroit, Mich., subject to change without notice.

All- Metal Pallet Rack and Nesting Ring

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For handling cases, kegs, barrels, hampers, bags, etc. All steel welded construction. Large ball bearing wheels with demountable rubber tires for easy, noiseless wheeling. Wt. 35 lbs.

B-490
\$18.75



DESIGNED AND MANUFACTURED BY

Palmer-Shile Co.

16012 Fullerton Ave., DETROIT 27, MICH.

An Oliver snow plow is an efficient unit for clearing snow from highways and city streets.



low
highways

❄️ *take the*
"worry" out of winter!

Get the jump on winter with efficient Oliver snow removal equipment.

Both Oliver "Cletrac" crawler tractors and Oliver Industrial wheel tractors and their full line of allied equipment can help you keep highways, streets and sidewalks clear of snow . . . keep traffic moving despite the heaviest snowfall.

And, an important cost-cutting advantage to you is the fact that these husky tractors are year-round units . . . snow plows and snow loaders in winter, earth-movers, loaders, shovels, pavement breakers, mowers, ditch diggers, etc., in other seasons. Why pay for a lot of specialized individual construction and maintenance equipment when Oliver and Oliver "Cletrac" tractors can do the job at far less cost.

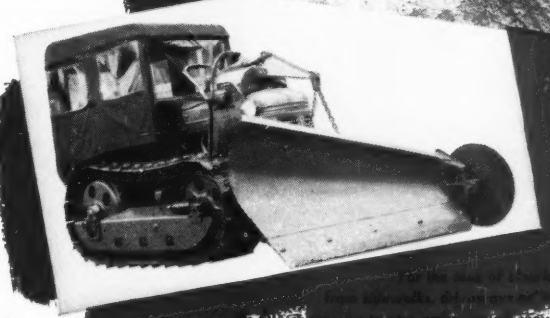
If you already own Oliver Tractors, ask your Oliver Distributor about snow removal equipment designed for your tractors. If not, you'll find it pays to investigate the Oliver line today.



An Oliver "Cletrac" and Hall Ditcher is a combination that is as efficient for snow clearing as it is for dirt moving.



An Oliver "Cletrac" and front loader gets high speed off the street fast and economically.



For the most efficient snow removal, ask your Oliver Distributor about the Oliver snow plow answer.



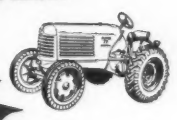
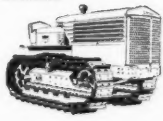
Cletrac

a product of

THE OLIVER CORPORATION

Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio

A complete line of crawler and industrial wheel tractors



"THE SIGN OF EXTRA SERVICE"

Merry

CHRISTMAS

NEW YEAR

and a Happy

Once again the time of peace and good will is with us.
At Christmas time we realize, more than ever, how much it means to have the
friendship and good will of folks like you.
To you, our friends and associates, we wish a Merry Christmas and a Happy New
Year.

FROM THE STAFF OF

Flow **MAGAZINE**

1240 ONTARIO STREET CLEVELAND 13, OHIO